THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

VOL. X. No. 218—13th YEAR.] LONDON, FEBRUARY 26, 1861. [Subscription per Ann. { 15s. in Advance / 18s Credit.] Price 8d. Unstamped.

CANNEL COAL.

RAMSAY'S NEWCASTLE CANNEL was discovered by the Advertiser in 1818. Cannel Coal was then little used in London: after surmounting much opposition, it has become the principal Cannel Coal used in the Metropolis, and has greatly assisted in improving the London gas. Its joint products of gas of high illuminating power, and coke of good quality, make it one of the most economical coals known. It is used by all the London Gas Companies, as well as by many Provincial and Foreign. The Crystal Palace was lighted from it in 1851, and the Post-office, Bank, and *Times* Office, are at present.

FIRE-CLAY RETORTS.

FIRE-BRICKS of all descriptions. Manufactory established in 1804.

RAMSAY'S GARESFIELD COAL and COKE.

Bone and Artificial Manures of all kinds.

Address G. H. RAMSAY, Offices, Broad-chare, Newcastle-on-Tyne.

April 27, 1854.

TO GAS COMPANIES AND PROPRIETORS.

WANTED, the entire or partial MANAGEMENT of a Provincial Gas-Work, or LEASE of one; or the Advertiser would advance £500 to £1000 to enlarge any existing Work, and take proportionate profit and share of management.

Address by letter to A. B. B., care of Messrs. CHEVALIER and Co., 12, Bell Yard, Temple Bar, LONDON.

TO GASHOLDER MAKERS.

TOWN and Borough of Rochdale. The Gas Committee hereby invite any person willing to undertake the Making and Fixing of GASOMETER 100 ft. in Diameter, in two lifts of 26 ft each, to send in a PROPOSAL for that purpose marked "Tender for Gasometer," to the Town-Clerk's Office, Yorkshire Street, ROCHDALE, on or before the 19th of March next.

Plans and Specifications may be seen, and any further information obtained, by applying to Mr. ROBERT BELL, Gas-Works, ROCHDALE.

By order,
ZACH. MELLOR, Town-Clerk.

Rochdale, Feb. 20, 1861.

READING Union Gas Company.—The Directors require the services of a MANAGER, thoroughly qualified by practical experience for the situation, and accustomed to the best method of setting and working Clay Retorts.

The salary to commence at £140 per annum, with Residence, Fuel, and Gas.

Applications, stating Age, with Testimonials of character and capabilities from present and previous employers, to be delivered to me on or before the 8th of March. W. G. HAYWARD, Clerk.

Bridge Street, Reading, Feb. 23, 1861.

COWEN'S PATENT FIRE-CLAY RETORTS

JOSEPH COWEN and CO.,

BLAYDON BURN, NEAR NEWCASTLE-ON-TYNE,

Were the only parties to whom a PRIZE MEDAL was awarded at the GREAT EXHIBITION of 1851, for "GAS RETORTS and OTHER OBJECTS in FIRE CLAY."

J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts in the United Kingdom; and orders for Fire-Clay Retorts of all shapes and dimensions, Fire Bricks, and every other article in Fire Clay, are promptly executed at their Works as above.

COWEN'S GARESFIELD COAL AND COKE.

Coal and Coke Office,
QUAY SIDE, NEWCASTLE-ON-TYNE.

FIRST PRIZE IN THE PARIS EXHIBITION.

JOHN RUSSELL AND CO.,

THE OLD TUBE WORKS,
CHURCH HILL, WEDNESBURY;

ALMA WORKS,
WALSALL, STAFFORDSHIRE;

and 69, UPPER THAMES STREET, LONDON,

Original Manufacturers of Wrought-Iron Gas Tubes, and Holders of the present Patents; Inventors and First Makers of LAP-WELDED FLUES for Steam Boilers.

J. R. and Co. make all kinds of Tubes and Fittings for Gas, Steam, and Water, and the largest Orders may be executed in a few days.

Gun Metal, and all other kinds of Cocks, Stocks, Dies, and Taps, Galvanised Tubes, &c.

N.B. All Goods thoroughly Tested before sent out, and Warranted.

ON COAL GAS,

BY
THE REV. W. R. BOWDITCH.
Post 8vo., Cloth 2s. 6d.
JOHN VAN VOORST, 1, PATERNOSTER ROW.

THE Knighton Gas Company, Radnorshire, are desirous to receive TENDERS for an IRON TANK, 26 ft. 4 in. diameter, and 12 ft. 6 in. deep, made of quarter-inch Wrought-Iron Plates. The weight of the Tank and the price per Ton delivered at the Works, to be given at the Works in the estimate.

Knighton, Feb. 15, 1861.

BLAYDON BURN AND LOW BENWELL FIRE-CLAY RETORT AND FIRE-BRICK WORKS, NEAR NEWCASTLE-ON-TYNE.

WILLIAM COCHRAN CARR begs most respectfully to thank the Metropolitan, Provincial, and Continental Gas Companies for their patronage for several years past, and to intimate that he has rebuilt and enlarged his extensive premises for the Manufacture of CLAY RETORTS; and that he is now prepared to execute the largest orders with punctuality and despatch. Orders for FIRE-CLAY RETORTS, of all shapes and sizes, FIRE-BRICKS, and all other Articles in Fire-Clay, executed on the shortest notice, and on the most reasonable terms.

London Agents:
JAMES LAWRIE & CO.,
63, OLD BROAD STREET, CITY, LONDON.

TO GAS COMPANIES AND OTHERS.

FOR Sale, a Cast-Iron Tank, 50ft. 9 in. diameter by 18 ft. deep, with a TELESCOPE GASHOLDER therein, the outside one being 49 ft. 3 in. diameter, and the inside one 48 ft. both 18 ft. deep, with 6 Cast-Iron Columns and Iron Framings, the whole in good working condition. Parties purchasing to remove the same at their own expense, within one month of acceptance of Tender.

All particulars to be obtained on application to the SECRETARY of the Brentford Gas Company, at the Office, Brentford, MIDDLESEX.

TO GASHOLDER & IRON ROOF BUILDERS.

BOROUGH of SALFORD.—The Gas Committee of the Borough of Salford are prepared to receive TENDERS for the supply and erection, on their No. 1 Station, Lamb Lane, Salford, of a TELESCOPE GASHOLDER, 100 feet diameter, and in two lifts, each 28 feet deep.

Also a WROUGHT-IRON ROOF, 191 feet long, and 77 feet span.

Plans and Specifications may be seen, and any further information obtained, on application to Mr. G. T. HALLS, the Manager on the Works.

Printed forms of Tender will be provided, which must be filled up, endorsed, and delivered at the Gas-Works, Lamb Lane, SALFORD, on or before Tuesday, February 19, 1861.

By order,
GEORGE BRETT, Town-Clerk.

Lamb Lane, Salford, Jan. 23, 1861.

COUNTY and General Gas Consumers COMPANY (LIMITED).—Works at Chertsey, Lea Bridge, Northfleet, Pembroke, Pembroke Dock, Ware, and Walton-on-Thames, producing a gas rental of about £6500 per annum.

Established for the erection of gas-works in provincial towns, or the purchase or leasing of existing works on equitable terms. Application to be made to the Engineer to the Company, Mr. H. P. STEPHENSON, 58, PALL MALL.

WOLVERHAMPTON RETORT WORKS.

ESTABLISHED 1840.

JOHN EUNSON & SON,

Gas Engineers, and Manufacturers of Clay Retorts

AND FIRE GOODS IN GENERAL,

WOLVERHAMPTON.

Retort Mouthpieces, Bolts, Nuts, and every description of Wrought-Iron Work.

THE IMPERIAL IRON TUBE COMPANY,

(SUCCESSORS TO GEORGE B. LLOYD & CO.,)

GAS STREET AND BERKLEY STREET,

BIRMINGHAM,

Manufacturers of Wrought-Iron Tubes and Fittings,

FOR GAS, STEAM, AND WATER.

PATENT GLASS ENAMELLED AND GALVANIZED TUBES,

AND

LAP-WELDED IRON BOILER TUBES.

JOURNAL OF GAS LIGHTING NEWSPAPER PENNY

THREE
MEDALS AWARDED TO
THOMAS GLOVER'S
PATENT DRY GAS-METERS.

LORD REDESDALE'S "SALE OF GAS ACT."

DRY METERS *VERSUS* WET METERS.

LONDON, February 25, 1861.

THOMAS GLOVER begs to call the attention of Gas Companies and others to a few *facts*, which, if duly considered, must lead to most important conclusions :—

1. That since THOMAS GLOVER commenced to manufacture his Patent Dry Gas-Meters (which is now upwards of 15 years), every Wet Meter Maker of any importance in England has been compelled to manufacture Dry Gas-Meters; and in the JOURNAL OF GAS LIGHTING, of date of 12th of February, 1861, Messrs. William Parkinson and Co., successors to the late Samuel Crossley, advertise that they "intend manufacturing *Dry* as well as" Wet Meters, and it is worthy of particular notice that they intend to do so "after 40 years experience in manufacturing Wet Gas-Meters of such a quality that has enabled them, as they say, to maintain a superiority over all other; and this, be it also particularly noticed, after they had advertised in the JOURNAL OF GAS LIGHTING, January 29, 1861, "their improved low-spouted Gas-Meter with new patent float arrangement, which entirely overcomes the difficulty experienced by ordinary Wet Meter."

2. That it is quite consistent with THOMAS GLOVER's knowledge that Wet Gas-Meters, called "low-spouted" or "compensating Wet Meters," have already been proved to be incapable of continuous working or registration, and for this reason the manufacturers of these Meters have been induced to seek the repeal of Lord Redesdale's (righteous) Sale of Gas Act.

3. That every year the Patent Dry Gas-Meter manufactured by THOMAS GLOVER has risen in favour with Gas Companies and Gas Consumers, placing him in the proud position of being the largest manufacturer of Gas-Meters in the country.

THOMAS GLOVER guarantees his Patent Dry Gas-Meters to meet all the requirements of the "Sale of Gas Act," to give accurate and unvarying registration with steady lights; and, from their peculiar construction, cannot be tampered with, and may be fixed in open situations even above or below the level of the lights. They work with less pressure than Wet Meters, and are not affected by the most severe frost.

THOMAS GLOVER guarantees to uphold all Meters sold by him for 5 years free of expense to the purchaser, or for a trifling per centage per annum will contract with any Gas Company to uphold their Meters of his manufacture for a series of years; and, at the conclusion of such contract, to lease the Meters all in perfect working order.

N. B.—Agents in several parts of England are wanted. Apply by letter, or personally.

WILLIAM PARKINSON & CO.,

(SUCCESSORS TO SAMUEL CROSLEY,)

COTTAGE LANE, CITY ROAD, LONDON,

Beg leave to inform Gas Companies and others that, having completed the alterations in rebuilding and enlarging their works, they intend manufacturing DRY as well as WET Gas-Meters.

In adding this important branch to their business, W. Parkinson and Co. pledge themselves to use the same quality of materials and workmanship in the Dry as in their well-known Wet Meters, and which for above forty years has enabled them to maintain a superiority over all others.

Owing to the facilities offered by the extension of their factory, a large quantity of both Wet and Dry Meters will always be kept in stock, which will enable them to execute all orders with as much promptitude as hitherto, and thereby gain the same patronage previously extended to them, and which they now respectfully solicit in this new undertaking.

CONTENTS.

Leading Articles:— PAGE

Notes upon Passing Events 111

Circular to Gas Companies 114

Correspondence:—

Blenkiron and Others *v.* the Great Central Gas Company 116

Misrepresentations of Mr. Hughes as to Public Lighting 116

Mr. Bowditch's Purifying Process. 116

Register of New Patents:—

Donnett, A. V.—Improved Registering Water-Meter 116

Pickstone, W.—Improvements in Tubes and Pipes 116

Kukla, F. X.—Improved Self-Regulating Gas-Burner 116

Stuart, J.—Improvements in Treating Hydrocarbon Oils 116

Bridgman, E.—Improvements in Wet Gas-Meters 117

West, R.—Improvements in Wet Gas-Meters 117

Provisional Protections 117

Notices to Proceed 117

Parliamentary Intelligence:—

Progress of Bills in House of Lords 117

Progress of Bills in House of Commons 118

Trade Marks Bill. 119

Legal Intelligence:—

Vice-Chancellor's Court.—Postle *v.* the Bury St. Edmunds Gas Company 119

Hills *v.* Evans 120

Miscellaneous News:—

Meeting of the Phœnix Gaslight and Coke Company 122

Meeting of the European Gas Company 124

The Metropolitan Gas Supply 126

Explosion of a Gasholder at the Preston Gas-Works 127

On the Manufacture of Oxygen and Hydrogen 128

Proposed Lighting of Pavia with Gas. 129

The Gas Concert. 129

Test for Sulphide of Carbon in Coal Gas 129

Price Current 129

NOTICES.

The subscription is 15s. per annum, if paid in advance during the month of January, or 18s. credit, in two sums of 9s. each, in July and January of each year. Post-Office orders must be made payable at the Charing-Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

The next number will be published on Tuesday, March 12, and the subsequent numbers on each successive alternate Tuesday.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, FEBRUARY 26, 1861.

NOTES UPON PASSING EVENTS.

THE cost, and the efficiency of our Navy, are two of the most important questions which Parliament ought to consider this session. At present, our Navy is so far from efficient, that naval men are constantly discussing the chances of a war, in which France, with her iron-cased frigates, might unite with some other naval power to attack, and endeavour to destroy, the prestige of centuries. The cost is so heavy for this unsatisfactory fleet, that it forms one of the largest items in our annual tax bill. We pay five millions a year to maintain our Navy, and five millions more for constructions and repairs, which are carried on in our dockyards. The seamen to man this fleet, amount to 85,000—too many to be composed of the best quality. A very slight inquiry will show convincingly that, in one important item, at any rate, repairs—the substitution of iron for wood—would effect an important annual saving. Our wooden ships are often rotten before they are launched; almost always in want of repair; and generally, when most wanted, require what practically amounts to reconstruction. In merchant steamers, the substitution of iron for wood has gone on with extraordinary rapidity during the last twenty years. Twenty years ago, not a twentieth part of the steamers of England were of iron; to-day, not one seagoing steamer in a hundred, now being built for merchant owners, is of wood. The cause of this change is not far to seek. Iron boats, according to the experience of the present generation, last for ever; decay is unknown. Paint them, and they are always ready for sea.

It was not the fault of Sir Robert Peel that this country is not provided with an iron war fleet: he was ready, if duly advised, to proceed with the construction of the iron frigates he found in progress on his accession to office in 1845. Had a decided step been made at that time, we should have had strength and experience, and not been obliged to discuss the great question on the foundation of French experiments. Unfortunately, one of the principal military and scientific authorities with the official world was, and is, or was very recently, Sir Howard Douglas,—an aged, industrious, zealous officer, without a particle of genius, and with undeniable prejudices against any improvements likely to destroy the value of the knowledge he has acquired, with much pains, during the course of a long and active life, and displayed in a work which has taken a place as a text-book with military and naval men. Sir Howard Douglas has told us how he replied to Sir Robert Peel's inquiries in his pamphlet on iron defences. "*I stated, in reply, that vessels wholly constructed of iron were utterly unfit for all the purposes of war, whether armed or as transports for the conveyance of troops.*" There has been a good deal of experience in the use of iron, both for transport and for war purposes since Sir Howard "put down" the attempt to introduce them into our Navy, but he disdains to use it; and, in a recent publication, reiterates his old opinions. He says, "That ships formed wholly or nearly of iron are utterly unfit for all purposes or contingencies of war, whether as fighting ships or as transports for troops. A 68-pounder solid shot would pass through the *Great Eastern* with tremendous effect and the perforation of the outer shell could not be plugged; she is an awful roller, and has never attained anything like the calculated speed." This last shot of Sir Howard's was unfortunate; it drew on him the fire of Mr. Scott Russell, whose reply has not left the veteran a fragment of reputation as a scientific and practical authority on iron ships, and has irrevocably fixed on him the character of the most mischievous obstructive of our time.

We refer our readers to Mr. Russell's pamphlet,* for his defence of the *Great Eastern's* speed and steadiness, which is chiefly interesting as showing Sir Howard Douglas's extraordinary inaccuracy as to facts which are on record, and easily investigated. As the *Great Eastern* may be taken as a specimen of a well-built iron ship, although not of a warship, we extract the reply to the assertion "*That a 68-pounder would pass through her with tremendous effect:*"—

1. A 68-pounder gun, or 8-inch gun, can fire at a ship a great variety of missiles. First, she can fire red-hot shot, which, fired into a wooden ship, would stick in her sides among the timbers, and set fire to the hull of the ship in a manner nearly inextinguishable. This same shot would either not enter the *Great Eastern* at all; or, if it penetrated her incombustible skin, would do no more harm to it than an ordinary bullet.

2. The 68-pounder gun can fire shells filled with molten metal, which, fired into the hull of a wooden ship, runs through all the openings, among the timbers and planks, in such a manner, that half a dozen such shells would be enough to disable and disorganize, if not destroy, the entire ship. The hull of the *Great Eastern* would either resist altogether the entrance of such shell; or, if it entered, she would not be affected by it more than by a cold bullet, unless, indeed, on her wooden deck; an evil which might be remedied by making all her decks of iron, as some of them now are.

3. A 68-pounder gun can throw percussion shells and time-fuse shells, either of which, entering the side of a wooden ship, would explode in such a manner as to blow open her side, or to blow up her between-decks. According to Sir H. Douglas's Treatise on Gunnery, the explosion of such a shell on board a ship is the greatest danger she can incur, short only of the explosion of her magazine; all who know anything of modern gunnery are aware that it has the most tremendous effect known in warfare. These same shells, fired at the *Great Eastern*, would, according to Sir H. Douglas's own statement, be deprived of all their explosive power, and could do no more harm than the accidents they might occasion wherever their fragments might strike.

4. The fourth missile of a 68-pounder is the common solid round ball, eight inches in diameter, which, passing through the *Great Eastern*, would probably make one hole a little larger than itself on going in, and a second hole perhaps larger than itself on going out, and, on its way through the ship, it would probably kill any men that stood in its way, just as it would do in a wooden ship, and neither more nor less. Where, then, is Sir H. Douglas's tremendous effect?

Of course, if a shot-hole in an iron ship could not be plugged as easily as it can be in a wooden ship, that would be serious;

* "The Fleet of the Future: Iron or Wood." By John Scott Russell, F.R.S.

but we find that Captain E. P. Charlwood, R.N., who has been fifteen years afloat—five years of that time in iron vessels—and daily under fire for four or five months in an iron war-steamer, the *Guadaloupe*, considers "iron vessels stronger than wooden vessels. Shot striking an iron vessel does less damage than to a wooden vessel," "There were nothing like the number of splinters which are generally forced through a wooden vessel's side." "The *Guadaloupe* was hulled three or four times: once in the midship part of the vessel, at about 1000 yards. The ball passed through the iron into the coal-bunkers, making a round hole. *No rent was made.*" Another shot which struck her, passed "two feet below the water, through the vessel's side, and through two or three casks of provisions. It was simply plugged by the engineer at the time; and, after the vessel was out of action, they put a plate of iron outside, and screwed it to the place where the hole was." "None of these shots displaced the rivets, or disturbed any of the rivets which fasten the plates, of which the frame is formed." Captain W. H. Hall—"*Nemesis* Hall"—says in China, "several wooden steamers were employed upon the same service, and they were invariably obliged to lay up for repairs; whilst I could repair the *Nemesis* in twenty-four hours, and have her always ready for service. Many wooden steamers were obliged to leave the coast of China, and go to Bombay for repairs. Repairs that would have taken in a wooden ship several days, would only take as many hours in our iron ship." "The *Nemesis* was hit fourteen times in one action; one shot went right through the vessel. There were no splinters; *it was just as if you put your finger through a piece of paper;* it did *not* tear the iron away." "Nothing could have been more easy than stopping that hole in the *Nemesis*." "On another occasion, the shot struck the ship's side obliquely and glanced off, making an indent in the iron. I think, if the vessel had been built of wood, it would not have glanced off."

The conclusions to be deduced from actual experience are—1st, that shots fired obliquely at a ship's iron sides, not more than half an inch thick, glance off, when they would have penetrated a wooden ship; 2nd, shots fired directly have passed through, doing less damage to the ship, and by splinters to the crew, than in a timber ship; 3rd, that the shot-holes have been as easily stopped, and more easily, quickly, and less expensively repaired, than in wooden ships; 4th, experiments, quoted by Sir Howard Douglas himself, show that thin plates of wrought iron, only five-eighths of an inch thick, are proof against shells; "plates two inches thick, are impenetrable to pieces of shell;" iron-plates, four inches and a half thick, are impenetrable to shot fired from the heaviest nature of guns;" finally, plates six inches thick are practically impenetrable.

In 1854, further experience was obtained, as to the comparative resisting powers of wood and iron. The attack of our fleet on the sea-entrance of Sebastopol, proved that wood could not make an impression on land forts adequately armed; and it was proved at Kinburn, that the Emperor of the French's iron batteries were shot-proof. But, there are other advantages possessed by an iron ship, besides those displayed in receiving or resisting shot. A ship of ironplates can be constructed, to be much stronger than a ship of wooden planks of the same dimensions; to carry more freight; to draw less water; and, as before stated, to require less time and money to repair after action, very little repair beyond paint, in time of peace. An iron ship is stronger than a wooden ship, for very simple reasons. If you put two bars of iron into the fire, you can weld them together as perfectly as if they had originally been a single bar, but two pieces of wood can never be welded; they can only be joined by taking a third piece of wood, as strong as either, and fastening it across the junction. The third beam is so much timber thrown away. It follows, therefore, that at every joint of two pieces of timber, there must be a third, having nothing to do but to join them. But when, instead of joining the ends of beams and bars together, it is necessary to join the edges of wooden planks and the edges of iron plates, the advantage is still more on the side of the iron plates. The edges of two adjacent iron plates can be riveted to each other, "or, as it were, sewed together, losing about one-fifth only of their strength by the holes made for the rivets." No method has been discovered of sewing or combining two wooden planks into one. The consequence is, that the planks of a ship are only to be kept together by a second, and sometimes a third, set of timbers, laid against the first. Thus, one-half the parts of a wooden ship are doing no service, except helping to keep the other half together. A large wooden ship is weaker than a small wooden ship, because, the wood being grown, not made, the pieces of which it is composed cannot be obtained proportionally large. A wooden vessel of 1000 tons contains probably 2000 principal pieces of timber in her hull. The difficulty is, to join these pieces so that they shall all resist the strain of a storm at sea; on the contrary, the iron pieces of an iron ship can be made of a size proportioned to the size of the ship, and the strength of a piece of iron, as compared with a piece of wood, increasing in a high ratio with its size. The iron ship is composed of a comparatively small number of very large and very strong pieces; while the wooden ship is composed relatively of very many small and weak pieces.

An iron ship will draw less water than a wooden ship. The weight of the hull of one of the largest frigates of the navy, of the new *Orlando* class, is 2500 tons. The weight of an iron ship, of equal tonnage, is 1500 tons. Put an equal equipment into both ships—say 2000 tons—and the war ship weights 3500 tons; the wooden ship, 4500. If the wooden frigate, with her equipment, sink 21 feet in the water, the iron frigate will only sink 17 feet, "*and this* difference would enable the iron ship to carry 1000 tons of coal, or anything else, on the same draught of water on which the wooden ship carries none. Thus, the *Orlando* would draw 23 feet with 1000 tons of coal; the iron frigate, 23 feet, with 2000. The strength of which iron ships may be made, has been shown in the *Great Eastern*, which, when struggling to be launched, hung for days on one-third of her length without starting a rivet; and the *Great Britain*, which for a whole winter was ashore on the Isle of Man without damage. Iron ships are, of course, much less exposed to accident from fires than wooden ships. The iron steam transport, *Sarah Sands*, caught fire while carrying troops to India. Her contents were burned out for about a third part of her length her magazine exploded; she encountered a gale of ten days duration after the accident; yet not a life was lost. Such an escape in a wooden ship would have been impossible. It is not necessary to prove that a properly constructed iron ship-of-war could best resist "*red-hot shot,*" "*shells of molten iron,*" and "*time—and percussion shells.*"

Experience has proved that the iron not only keeps out the shells, but in certain circumstances the shot also. At small angles, such as the bow of a fine iron ship presents to the guns of an enemy on which she is bearing down, the shot is deflected altogether, and turned aside. Iron plates, less than an inch thick, do this effectually. For angles less sharp, a greater thickness will still suffice to turn aside the shot. At still greater angles, three inches suffice to turn aside the heaviest shot; and iron plates, properly employed as armour, 4½ inches thick, have been nearly sufficient to stop altogether and keep out the heaviest shot fired with the highest velocity from the nearest practicable distance, and only a very few shot in exceptional circumstances have ever passed through a sound good iron plate 4½ inches thick. And when we go to 6 inches thick of good tough wrought iron, there is no one practically acquainted with the subject who has ventured to suggest even that such a plate could be destroyed in actual warfare by a blow from any known projectile.

What is true and may be frankly conceded is, that every time you strike a ship coated with iron armour quite fair with a steel bolt, you will do some damage; you will scratch the plate, or crack it, or indent it, or widen a seam, or knock off a corner of a plate; and, if when you have done this once, you can strike the same joint a second time, a third time, and a fourth time, you may by continual hammering ultimately harm the plate. break it to pieces, knock in its fragments: and in the end, giving you plenty of time, an inexhaustible arsenal of missiles, a quiet sea, and no one to trouble you, you will damage the ship and ultimately make her a wreck. There is but this difference between the two, that what it takes hours to do to the iron-coated vessel by the wooden one, will be done in minutes to the wooden ship; that is all—hours against minutes!

Two wooden first-rates, armed as they are now armed, engaged in combat, would one or both inevitably sink after five rounds of artillery, at close quarters.

The author of the pamphlet from which we have condensed the preceding summary of Iron *v.* Wood, says truly:—

It was an unlucky day for Wooden Walls when Captain Halsted and the *Trusty* were attacked by Armstrong's largest guns, and his heaviest steel bolts. That day, the opponents of iron suffered a terrible defeat. The iron plates of the *Trusty* were found to be, practically, shot-proof. He saw that the *Trusty* came out of the trial triumphant. She could be damaged by shot; could be injured by steel bolts; was the worse for Armstrong guns; but was practically, and for purposes of war, invulnerable. To this conclusion came every practical man who saw the experiment, and every practical man who, like myself, examined the effect of those iron plates upon the shot. To have seen, as I have, a long steel bolt, fired as an elongated missile from Armstrong's gun, squashed up endways like a bit of clay on the iron armour of the *Trusty*, was to be convinced that iron mail-clad vessels like the *Trusty* were too strong even for the Armstrong artillery.

But the Admiralty were not convinced, although another department of the Government was; for the construction of huge wooden ships—"slaughter-houses," as they have been aptly called—proceeds at a steady, official pace. The authorities responsible for the new fortifications *have determined to*

form all the embrasures of the casemates of iron, and have introduced it into all their designs and specifications. The pamphlet concludes with a detailed plan for reconstructing the Navy of Great Britain, with vessels of six classes; from the first-rate to the despatch boat. The total cost of constructing this fleet Mr. Russell estimates (in detail) at twenty millions. He calculates that this fleet can, when built, be maintained, in ordinary, for £200,000 a year; and be, at the end of twenty years, if not used in action, as serviceable as when built. A wooden fleet would entirely disappear, in that time, from dry rot, and other sources of decay; or would cost, to be kept up to the mark, something near five millions a year. The iron navy suggested would be less numerous, and efficient in the proportion of 1 to 4, and could be fully manned by one-fourth the number of men now in naval pay. Here again is the means of an enormous economy, accompanied by the efficiency implied in a navy manned by 25,000 picked seamen, at higher wages than the 85,000 now gathered together with great difficulty. Thus, the twenty millions for reconstructing an indestructible navy are to be found out of the five millions we pay for repairing and reconstructing wooden ships, and the other five millions we pay for manning and maintaining the fleet afloat. Evidently, these are solid propositions well worth discussing. If sound, they insure the naval pre-eminence of a country which has more iron, more capability of manufacturing iron, and more sailors to choose from, than any other country in the world. In another point of view, it is most interesting; it shows how the Admiralty Board may be, if not reconstructed, reduced to harmlessness.

The banquet given to Sir Arthur Cotton, on whom the Queen has recently conferred knighthood, in acknowledgment of his eminent public services, marks impressively the commencement of a new era in the administration of India. More than a hundred noblemen and men of rank consented to be stewards to this banquet. Amongst them were the Marquis of Tweeddale and Lord Harris, both ex-Indian governors; Lords Stanley and Lyveden, both ex-presidents of the Board of Control; besides several gentlemen who held a high position in the late East India Company. And yet it is only five or six years ago that Colonel Cotton, after having published in India his celebrated book on "Public Works," came over to this country to restore his health and impress his views on the British government and the British public, and was considered by the majority of old Indians much as the Pope looks a Garibaldi, a rebel and destructive. All that feeling has passed away, and Colonel Sir Arthur Cotton's principles—viz., that additional revenues can only be obtained by the construction of reproductive works—are universally acknowledged by the leading politicians, of every shade of politics, to be sound. We do not share Sir Arthur Cotton's prejudice against Indian railroads, although it is impossible to deny that much greater agricultural results might have been obtained, had the capital expended on them been laid out in improving river navigation, and constructing canals of navigation and irrigation. But, in the first place, you never could have raised the same capital for works with which the European people are so little acquainted; and, in the second place, railroads are the only instruments that could induce a new class of Englishmen and capitalists to investigate the resources of so vast an empire. The great merit of railroads is summed up in the engineer's phrase, "they rip up the country." Sir Arthur Cotton's career ought certainly to be an encouragement to the perseverance of all those who take a good and great cause in hand. He went out to India from Addiscombe, in 1821, at the same time as Sir Proby Cautley, "the engineer of the Ganges Canal, and the founder of (English) hydraulic works in India." In 1828, he was sent to Tanjore, where, from a change in the delta of the river, there was alarm lest the country should be left without water. The result of his works has been that the revenue of Tanjore and the delta of the Cauvery, which in 1830 was £300,000, is now £600,000 a year—ten times as much as the revenue of Cuttack, which is similar delta-land, but as yet not favoured with the needful hydraulic works. In 1844, Sir Arthur Cotton went to Rajahmundry, where, eleven years before, a quarter of a million of people had died of famine. He there conceived his plans for a great work of irrigation and navigation. Nothing could seem more hopeless than his chances of connecting his name with such an undertaking. To invest hard money, in order to obtain future returns, was contrary to all the traditions of Indian Government; and English governors could not be expected to have much sympathy with an undertaking of a class rarely required by the English soil and climate. Colonel Cotton's memorials were long treated as waste paper—the ravings of an enthusiast; but he persevered, and became a fearful bore. At length, he found a friend in the Marquis of Tweeddale, who was known in Scotland as an experimental agriculturist and amateur mechanic before he was appointed Governor of Madras. He had the acuteness to see the value of Colonel Cotton's irrigation plans, and influence enough to obtain the sanction of the Governor-General. The work consisted of a weir across a river four miles wide, with 1500 miles of channel and branch channels, irrigating 700,000 acres out of 1,100,000 acres commanded by the weir. The revenue from the district was £196,000 when the work was commenced, and there has been a regular increase from the time it began to operate until last year, when it reached £320,000 a year. This was not from levying more taxes, but from the increased value and rent of land, before nearly, or absolutely, barren. The exports of agricultural produce have increased more than ten-fold. The district which formerly imported grain now not only feeds itself without importation, but imported last year £70,000 worth of foreign merchandise. On the main canal, from the Upper Godavery, in the first year that it opened, 700 boats passed; last year, they had increased to 13,000, and most of them of double tonnage. Four hundred thousand pounds had been spent on these Godavery works, not one-third of the land to be watered has as yet been watered by it, yet the returns are 35 per cent. on the outlay. Sir Arthur Cotton declared that, if similar works were erected in other districts of India which he could name, the revenue would be increased by eight millions sterling. He also said, that "the reason the Ganges canal had not hitherto answered the expectations of its promoter, was only because the branch canals, to distribute the water in the folds, had not been made, so that not one-tenth of the water could be utilized." Economical reductions had, in fact, prevented the million and a half sunk on the Ganges canal from being productive. The broth was spoiled, for want of a half-pennyworth of salt! It was not the local wisdom of an old Indian that brought into work Sir Arthur Cotton's great and useful abilities; it was the influence of a nobleman, fresh from his country of continual rain; it was the "troublesome and meddlesome" press, that created for him the position he so well deserves in England, as adviser and administering officer of the governing powers.

A bill has been presented to the House of Lords by the Lord Chancellor, for making the forging or imitation of trade marks a misdemeanour. At present, the ordinary remedy is by a motion for injunction in Chancery, with the chance of suits at common law. This bill, which also protects, and in fact creates, a copyright in paintings and other works of art, is to be worked with very simple machinery. "Forging or imitating" a trade mark, or "selling or exposing for sale articles bearing a forged trade mark," will be in future a misdemeanour; as also will be *marking a false quantity* or *counterfeiting* "any name, word, letter, initial, cypher, monogram, or other marks," *used by artists to identify their works*. The disproof of fraudulent intention will lie with the defendant. Persons found guilty of a misdemeanour under this bill are to be liable to punishment by imprisonment for not more than two years, with or without hard labour; or by fine; or both—conviction "not to take away any legal or equitable remedy." If this bill becomes law, it will no longer be lawful to mark a reel of thread which only contains 100 yards with 150, or to imitate the marks of Landseer or Herring, or to sell German imitations in iron of Sheffield steel, either for home use or exportation. It will also be possible to conclude treaties of mutual protection with foreign countries.

Sir George Lewis has reintroduced the bill of last session for the better management of highways. Under this bill, the county magistrates are to have power to form highway districts,—for each of these districts a highway board is to be constituted and incorporated, and have *perpetual succession, a common seal, and power to hold lands for the purposes of the highways*. The inhabitants of every parish comprised in a district are to elect annually one or more waywardens. These highway boards are to have power to purchase land, level, straighten, and otherwise improve roads, without going to Parliament every time for an Act. Unnecessary highways may be discontinued. This would seem to be a useful workable measure.

But there is another Act still more required, if county work of every kind is to be satisfactorily transacted; and that is,

an Act for creating "County Financial Boards," elected by, and responsible to, the ratepayers. The discontent amongst the farmers, and others paying taxes imposed on them by the numerous irresponsible, unbusinesslike body of magistrates, has lately found vent amongst the boards of guardians of the midland counties. Very strong resolutions in favour of financial boards have been adopted. The magistrates who govern the counties seem every year to become more reckless and more extravagant. It is not that the tenant-farmers, and other ratepayers of the middle class, desire to introduce anything in the shape of a social revolution; but they wish to pick and choose their men, and enforce a uniform system of accounts, an efficient audit, and due discussion, before adopting projects for spending county money. Two classes of men most unfit to transact actual business, are found governing the counties, *ex-officio*, as magistrates. First—Gentlemen of family and fortunes so large that they do not manage their own affairs, but intrust them to men of business, *i.e.*, to their agents. Secondly—Half-pay officers and clergymen of aristocratic connexions, who are notoriously bad men of business. In many counties, the whole financial business has drifted into the hands of two or three busy gentlemen, who, from year to year, without change or inquiry, do as they please; hence, extravagant and useless expenditure in jails, lunatic asylums, militia armories, &c., &c. If the power of selection and election were placed in the hands of the ratepayers, the class who now as magistrates manage county affairs would not be absolutely excluded from the financial boards, but the best would be chosen, and the obstinate obstructives, the jobbers, and the meddling gossips, would be found out, and weeded out. There can be no reason why counties should not have the representative institutions, as regards taxation and expenditure, enjoyed by boroughs, and even by the rural localities of Canada and Australia; there is more reason than ever, since new county work is to be created by these Highway and Assessment Bills. In one county, within an hour's ride of London, the finances have been so long under the control of one old gentleman, that he treats any inquiry into them as a personal insult—as an impertinent prying into his private property. In another, the magistrates have lately sanctioned the expenditure of a large sum for an armoury, forgetting that they had on hand, and to be sold for the materials, a disused lunatic asylum, perfectly suited for the purpose. In elective financial boards, the really intelligent, active magistrates would be sure to find seats.

Circular to Gas Companies.

The gas companies of the metropolis, after some delay necessarily caused by the difficulty of obtaining their united opinions on the subject, have replied to the memorandum sent to them by the Secretary for the Home Department respecting the form of accounts they should present in compliance with the 41st section of the Metropolis Gas Regulation Act. The chairman of the Chartered Company, to whom the memorandum was addressed, has on behalf of all the metropolitan gas companies submitted a form of account to which they have agreed, as comprising every particular necessary to show the state of their financial affairs sufficiently to enable the Home Secretary to ascertain the actual condition of the concerns of each company, as required by the Act. The form of account proposed to be sent in would give, in the first place, particulars of the incorporation and separate Acts affecting each company. In the capital account the amount of capital would be stated with particularity according to the varying circumstances of each company, and the credit side would show the amount invested at specified dates, the sum expended on the extension of works at specified times, and the amount of debentures paid off. It is proposed to show, on the debit side of the revenue account, the sums received for gas, for meter rental, coke, breeze, tar, and ammonia; and on the credit side the following items would be particularized—coals, including freight, lighterage, carriage, and dues; purifying material; wages; rent, rates, and taxes; direction and audit; salaries; collectors commissions; stationery, printing, and general charges; wear and tear; interest on capital arising from profit; interest on amount paid in anticipation of calls; debenture interest; bad debts and allowances; restoring and replacing meters; law and parliamentary charges; and contingency fund. These particulars seem to be sufficiently ample to be laid before the Home Secretary and Parliament to give them a correct insight into the general affairs of each company. A more detailed account, as observed by the chairman of the Chartered Company, "entering into a description of the different stores used in the various branches of the companies works, and the prices paid for them, would not convey any more valuable information than is contained in the form of account now submitted, and the accuracy of such account may be verified under the provisions of the Gas Works Clauses Act, to which all the companies are now subject." The form of accounts proposed by the gas companies is not, indeed, so full as that required by Mr. Beal in his memorandum to the Home Secretary, for that inquisitorial gentleman wishes to have exposed to public view the whole transactions of each company. He would examine the stores, the process of manufacture, the state of the works, and the nature of the repairs; he would ascertain the exact number of meters in use, and in the course of repair; and how every man to whom wages are paid was employed. The accounts proposed, without entering into such unnecessary details, would specify everything necessary to act as a check on the companies in their transactions with their private customers, and with the public. Had the gas companies taken the initiative in the matter, as they ought to have done, and submitted to the Secretary of State in the first instance the form of accounts now given, the question would most probably have been satisfactorily settled without any reference to Mr. Beal. With the exception of the form of accounts to be rendered, and the rents to be paid for the hire of meters up to five lights, no substantial difference of opinion appears to exist between the gas companies and the local authorities, as to their respective duties and obligations, under the Act of last session.

Gas agitation, we are glad to perceive, is at a discount in the metropolitan parishes. The proceedings of the vestries and district boards, as reported in another column, show clearly that the tide has set strongly against Mr. Hughes, the arch-agitator, and that they have come to the conclusion that their connexion with him is calculated to do more harm than good. It had been proposed to appoint him gas examiner-general for the various parishes of the metropolis, and the Wandsworth Board, who had consented to his appointment for their district, applied to the other boards and vestries to unite in appointing him to that office, for the metropolis generally; but not one of them would agree to the proposition, therefore that arrangement has fallen through. Even in Mr. Beal's own parish of St. James, a motion was carried to the effect that the works superintendence committee should at once dispense with Mr. Hughes's services. The gentleman who made that motion stated frankly, that he did not bring the matter forward from any feeling of unkindness to Mr. Hughes, but simply because he thought the longer they employed him, the worse would be their position. The approaching payment of the bill of £5022 for expenses incurred in obtaining the Metropolis Gas Act, operates strongly as a sedative to agitation. The bill has been taxed once, and it was to undergo a further taxation yesterday, for the purpose of endeavouring to strike off something more from the charges of the promoters. The account is classed under three separate heads, one of which comprises "sundry expenses" charged by Mr. Beal, to the amount of £2685; the second consists of certain charges by the vestry-clerk of St. Martin's, to the amount of £83; and the third is the bill of the parliamentary agent, amounting to £2254. It was hoped that, by a strict scrutiny by the taxing-officer of the House of Commons, aided by the vestry-clerks, considerable reduction might be made from the sums charged. One item of £1000 for copies of the evidence, printed before the committee met, was stoutly objected to at the meeting of the vestry of St. George, Hanover Square. Though the honorary secretary and the honorary engineer of the delegates discharged the duties of those offices very zealously without salaries, it may be found that they were more liberal in their expenditure of the parishioners money than paid officers would have been.

The question of meter rents has been raised in a district paper, supposed to be under the influence of Mr. Beal, by the letter of a correspondent—probably no other than Mr. Hughes—who complains of the charges of the gas companies as being grossly illegal. This correspondent asserts that one company has raised the meter rents 33 per cent., and that another company charge as much as 10s. for a ten-light meter, the cost of which is stated to be only forty-eight shillings. The com-

panies are bound by the Act to supply meters up to five lights for a rent of 10 per cent. on the net cost; but it is asserted that double that amount has been charged in some instances. The correspondent who makes these complaints omits to state that the Act authorizes the gas companies to charge for connecting the meters with the service-pipes from the point of entrance on the consumer's premises, and the amounts charged in the cases to which he alludes most probably included the charges for making those connexions. He very considerately mentions the prices of meters of various sizes, and recommends gas consumers to provide their own, as the Act gives them full power to do; so that this attempt to get up a grievance out of the charge for meter-rents contains its own refutation, as generally happens with the grievances concocted by Mr. Hughes.

The Bill of the Dover Gas Consumers Company has been lost, in consequence of the Standing Orders Committee of the House of Commons having refused to suspend a standing order, which requires that the site upon which it is proposed to build the intended gas-works should be set forth in the bill. In this case, the preamble of the bill recited that land had been agreed to be purchased for the erection of gas-works, and its situation was set out; but in the enacting portion of the bill, it was not stated that the works were intended to be erected on that site, and this omission was held to be fatal to the bill. The standing orders were, however, suspended in the case of the Bolton Corporation Bill, the object of which is to compel the gas company to sell their works, and the bill has been permitted to proceed. The stages of the other gas bills before Parliament will be ascertained by reference to our parliatary intelligence.

The Parochial Assessment Bill was read a second time on the 18th inst., and is to be referred to a select committee which will probably be named on the 4th proximo. At present, it is not proposed that this committee shall hear any evidence, but the strong objections to the measure expressed by the metropolitan vestries, and by some of the local provincial authorities, will probably compel the committee to hear some evidence; and we believe the railway, and the gas and water interests are taking measures for the purpose of laying their grievances before them.

Our old acquaintance, Mr. Flintoff, the active provincial gas agitator, is at present making Glasgow the scene of his operations. There has been, for some time past, a lurking discontent in Glasgow, because the price charged for gas there is higher than in Liverpool and other large towns that are not so conveniently situated for the supply of cannel coal, and examinations have accordingly been ordered into the accounts of the two companies which supply that city with gas, for the purpose of ascertaining whether the public were not entitled to a reduction of price, in accordance with the provisions of the Gas-Works Clauses Act, as the maximum dividend of 10 per cent. has been paid by one of them yearly, from 1853 to the present time. The first of these examinations took place in November, 1859, by an accountant appointed for that purpose by the sheriff of Lanarkshire, on the petition of a certain number of gas consumers; and a searching investigation of the City and Suburban Gas Company's accounts was made, extending as far back as the year 1845. Another investigation took place, at the close of last year, into the affairs of the Glasgow Gaslight Company by the same accountant, by order of the Town Council, and with the consent of the company. The results of these examinations show that in 1845, when the paid-up capital of the former company was £114,520, and the price of gas 6s. 8d. per 1000 feet, the dividend paid was 3½ per cent. In 1847, the price was reduced to 5s., and a dividend of 6⅔ per cent. was declared. In 1852, the dividend amounted to 9 per cent., and a considerable sum was set aside for depreciations, for which scarcely any allowance had been made in previous years. In the following year, the cost of coal was reduced to 9s. 9d. per ton, and the dividend was increased to the *maximum* of 10 per cent., with a further large addition to the depreciation-fund. The accountant, in his report, observes that this prosperous state of the company's affairs was to be attributed "to the gradual and profitable extension of the business of the company to the increase of population, the development of trade, and the diminished cost at which the company were enabled to procure coal." In 1854, which was equally prosperous, a reduction was made in the price of gas to 4s. 7d. This state of prosperity did not continue; for, in the year succeeding, the price of coal rose to 16s. 2¾d., wages advanced 20 per cent., and the surplus revenue would not have allowed a dividend of 8 per cent. The directors, however, determined to maintain the maximum point, and made up the deficiency from the premium account on shares sold. At the close of the same year, they also raised the price of gas to 5s. In 1857, the premium account was again placed under contribution to make up the dividend of 10 per cent, and the same resource was applied to in 1858. The conclusion arrived at by the accountant from the examination of the accounts to that date was, that "at no period prior to the balance of June, 1858, was the company able, unless from sources other than the regular profits derived from the making of gas, to pay the *maximum* dividend of 10 per cent., allowed by the statute." In 1859, an improvement took place, but the surplus revenue was only barely sufficient to pay 10 per cent., and the accountant reported that, from the year 1854 to that time, no allowance had been made from the revenue for depreciation of the works and plant. The examination of the Glasgow Gaslight Company's accounts, during the last three years, exhibited a more substantial condition, for it appeared that there had been added to the depreciation-fund, after payment of the *maximum* dividend, a sum of £2274.

From this survey of the affairs of the Glasgow gas companies, the temptation for the formation of a rival company does not appear so strong as the fact of the payment of dividends of 10 per cent for a continuance of years would lead speculators to suppose. The price of gas, though nominally 5s. per 1000, is reduced by discounts to a fraction above 4s. 6d., and the cost of manufacture is stated to be from 3s. 7d. to 3s. 11d. There is, however, quite sufficient on the surface to form a pretence for getting up a consumers company, and Mr. Flintoff is not the man to lose such an opportunity. A preliminary prospectus of a "Glasgow Gas Consumers Company" has been issued, of which Mr. Flintoff is to be engineer, that proposes to supply gas of 10 candles better quality than the parliamentary standard for the city of Glasgow for the price of 3s. 6d. per 1000 feet, with a prospective reduction to 3s. The capital of the company is to be unlimited, in shares of £1 each, with a deposit of only *sixpence per share*. In that bait lies the main feature of the scheme, and, probably, its only substantiality. An unlimited number of sixpences would amount to a sum worth pocketing, but we hope our Scotch friends are too "cannie" to part with even their sixpences in exchange for mere words. Mr. Flintoff has been haranguing the Trades Council, and public meetings are about to be convened to give further scope to his eloquence. He will thus have an opportunity of explaining by what process he can make gas for 6d. per 1000 feet, as stated in the prospectus (6d. is a pet sum, it will be observed), while it costs the Glasgow gas companies 3s. 10d.; and he will thus be enabled, also, to state publicly the reason why the appointment of engineer to the Lanark Gas Consumers Company (Limited), which he recently held, became vacated before the first tank was finished.

In order to meet the enormous development which the consumption of gas is now experiencing, gas companies, even in our second and third rate provincial towns, have to provide apparatus and vessels of dimensions, which a few years since it would have been deemed hazardous to attempt to construct. Thus, the gas company of Cheltenham—a town which, in 1851, contained only 35,000 inhabitants—is now about to construct a gasholder tank, 140 feet in diameter by 25 feet deep, under the able direction of Mr. Esson, the company's engineer; while the metropolitan Imperial Gas Company have commenced the erection of three tanks, arranged within a triangle, and connected with each other, of the respective diameters of 145 feet, 134 feet, and 105 feet, all being 55 feet deep, upon land purchased at Agar Town, in the vicinity of their St. Pancras station. The foundation-stone of this remarkable work was laid on the 20th inst. by Mr. Richards, the deputy-governor of the company, and we purpose in a future number giving some of the structural details of this work, and especially of the mode in which the timber shoring has been constructed. The designs of the tanks have been made by Mr. Methven, the engineer of the St. Pancras station; and the contract has been taken by Messrs. John Aird and Son, the eminent contractors of Belvedere Road, Lambeth. The cost of the three tanks alone, when completed, will be about £30,000. The gasholders are to be single lifts, and will contain two million cubic feet.

Two more of the actions brought against the Great Central

Company, for damages in connexion with the fire on Messrs. Morley's premises in Wood Street, are set down for trial at the present sittings of the Court of Queen's Bench, at Guildhall; but it is more than probable, from their state on the list, that they will be postponed till the next sittings.

Correspondence.

BLENKIRON AND OTHERS *v.* THE GREAT CENTRAL GAS COMPANY.

SIR,—I have received so many inquiries as to my reported connexion with the above matter, that I should esteem it a favour if you would allow me to state, in your JOURNAL, that I am not, and have never been, engaged either directly or indirectly, for the plaintiffs in this case. ALFRED PENNY.

Wenlock Iron Works, City Road, Feb. 22, 1861.

MISREPRESENTATIONS OF MR. HUGHES AS TO PUBLIC LAMPS.

SIR,—I have seen to-day, for the first time, a statement, inserted in and written by "A penny West-End Examiner," on the "public lighting of the metropolis," which gives a false colouring to facts, and conveys the impression that the "*late honorary* engineer" is guilty of the same conduct towards the gas companies as he so recently attributed to his colleague at the Metropolitan Board with regard to himself.

The statement to which I refer commences thus—

"Camberwell, 120 lamps, South Metropolitan, at £5 0
" 270 " " " 4 15;"

and then proceeds to argue that, as these lamps ought to be charged only £4. 6s. 9d., the parish are paying the company £190. 17s. 6d. per annum in excess; but the writer (doubtless, intentionally) has omitted to insert that, *when* the parish were paying these prices for 390 lamps, they were also paying only £4. 4s. for more than double that number.

The object of this second well-manufactured table on public lights is to lead the vestries to believe that "the whole sum assessed in respect of the Metropolis Gas Act may be saved in a single year in the contracts for the public lighting alone;" but, instead of this particular parish saving the "whole sum," it will be seen, by the following figures, on the "*late honorary*" agitator's *own basis*, that they are paying £127 per annum too little.

The table is continued thus:—"4 feet an hour will give a light of 9·6 candles, or nearly the same light as 5 feet an hour at the old standard of 12 wax." [Has the writer's memory again failed him, or is it necessary to remind him that he repeatedly stated to the committee of the House of Commons, that the companies all gave "more than 12 sperm?"] "4304 hours, multiplied by 4 feet, is equal to 17,216 cubic feet of gas required per lamp;" and "17,216, at 4s. 2d., is equal to £3. 11s. 9d." for the gas; to which is added, "the company's own excessive price of 15s. for lighting, cleaning, extinguishing, &c.," making £4. 6s. 9d. The company's present charge is £4. 7s. 6d. per lamp, in which is included the "excessive price" of 21s. 3d. for lighting, &c., instead of 15s., as here stated.

Although I should not have the least difficulty in proving to the satisfaction of any impartial person that the public lamps consume considerably more than 17,216 feet, I am willing to assume these figures are correct, and put down the price for the gas at £3 11 9
To which I add, for lighting, &c. 1 1 3

Making £4 13 0

or 5s. 6d. per lamp less than the price ought to be for "4 feet per hour." This, I presume, the "*honorary*" advocate will admit, if I can convince him or any independent vestryman that my charge of 21s. 3d. is *not excessive*. I therefore proceed to explain how this is made up. The lighters are paid 3s. per day, or 21s. per week; they are required to light as many lamps as can be done in one hour; and, as the distances between the lamps vary from 60 yards to 120 yards, it is quite clear that the wages paid for lighting will be greater in some parts than in others. Hence, if Mr. Hughes admits that 13s. is a fair price for lighting lamps at Westminster, placed at distances of 50 yards, he cannot object to allow for Camberwell a much higher price, where a large number are 100 yards apart, and all are upwards of 60 yards, unless he is prepared to contend that "the poor man's pay of 3s. *a day is excessive*."

I inclose my card, but I suppose, when placed in comparison with the "*late honorary* engineer," I must be content to be considered as AN IGNORAMUS IN THESE MATTERS.

February 18, 1861.

MR. BOWDITCH'S PURIFYING PROCESS.

SIR,—This afternoon I tested the gas supplied by this company with the Rev. W. R. Bowditch's apparatus, as furnished to me by Mr. John Saville, jun., of Wakefield. I first applied what the reverend gentleman terms "my hot process," and I must cordially admit, although the gas (made entirely from Wigan coal) would not affect the usual tests, yet, after passing through the hot tube containing lime, that such tests were very plainly discoloured. As I doubted whether the *lime* contained in the hot tube possessed any chemical power in breaking up, or decomposing the sulphur compounds in ordinary well-purified gas, I replaced it in the aforesaid tube, with particles of *common fire-brick*, of the same size as the lime, and I found, as I anticipated, that the test for sulphuretted hydrogen, was as much affected by the gas after passing the heated tube, as when *lime* was used. It appears to me that, in whatever way ordinary well-purified gas is heated,—say from 300° to 350° (providing the substance used has no chemical action upon the gas), the vapours of sulphide of carbon are decomposed, and that the sulphuretted hydrogen and carbonic acid generated can be afterwards removed by the ordinary lime purification. I subsequently passed the gas made at these works through an apparatus containing cold clay and lime, as furnished to me by Mr. Saville; but, in this instance, the damp acetate of lead-paper was not at all discoloured.

I am not aware whether Mr. Bowditch, in his patent, considers that heated lime *only* decomposes, or, as he states, "breaks up," the sulphide of carbon (as, in his small work on coal gas, June 13th, 1860, he mentions no other substance but *lime* in connexion with "my hot process," and *clay* and *lime* in the *cold process*); and I therefore send you these few lines, hoping that you will insert them in your next publication, so that other parties connected with gas engineering may have an opportunity of verifying, or otherwise, my experiment with fire-brick dust, stone, or any other material that will *mechanically* communicate heat to the gas under examination, for the purpose of ascertaining whether it does or does not contain sulphide of carbon. ORLANDO BROTHERS.

Gas-Works, Blackburn, Feb. 15, 1861.

Register of New Patents.

1852.—ALPHONSE VITAL DONNET, C.E., of Lyons, for "*An improved registering water-meter.*" Patent dated July 31, 1860.

The novelty of this invention consists in the particular combination and arrangement of all the pieces producing the distribution of the liquid in either parts of a cylinder, and the way of reversing the direction of this distribution, either by means of a circular sliding-valve or a combination of double-lift valves, the first one being actuated by a saving motion catching a small stud, projecting on its shaft, which is driven by turning in the right and left directions, causing the valve to open the water-ports to communicate now with the lower then with the upper part of the cylinder, the double-lift valves being also actuated by a sawing-lever, which, when moving, drives, in opposite directions, two sliding-rods carrying the lift-valves, in order to open at once the inlet of the upper part of the cylinder, and the outlet of the lower part, and *vice versâ* the swing or vibrating motion in both cases being driven by adjustable studs, fixed on a rod tied to the piston-rod.

1858.—WILLIAM PICKSTONE, of 32, York Street, Manchester, for "*Improvements in the manufacture of tubes or pipes.*" Patent dated July 31, 1860.

This invention has for its object improvements in the manufacture of tubes or pipes. For this purpose canvas, or felt, or paper, or any other textile fabric, is employed, coated with tar, pitch, indiarubber, gutta-percha, or any similar material, wound spirally in layers, together with layers of thin metal, such as brass or steel, also wound spirally around. The pipes may be made of alternate layers of textile fabric and metal or otherwise, according to the strength required; and longitudinal layers, either of metal or of textile material, may be introduced between the spiral layers, if required.

1878.—FRANCIS XAVIER KUKLA, of Pentonville Road, London, for "*An improved self-regulating gas-burner.*" Patent dated Aug. 3, 1860.

This improved self-regulating gas-burner is made in two parts, to screw or be otherwise connected together. The lower part of the said burner is provided with a nipple, and the said nipple is covered with a loose cap, which rises by the upward pressure of the gas, and acts as a valve for regulating the passage of the same. Over the cap and nipple is screwed the top part of the burner, and the interior of that part of the same, surrounding the said cap, is made conical, by which means, in proportion as the cap is raised, the annular space around the same is diminished, and the emission of the gas from the burner is decreased. Above the said conical part of the burner is placed a piece of fine spiral wire, through which the gas passes on its way to the aperture of the burner. Gas-burners constructed as above described, will regulate and economize the consumption of gas, and effect its thorough combustion.

1956.—JAMES STUART, of Vulcan Place, Castor Street, Poplar, London, for "*Improvements in treating hydrocarbon oils.*" Patent dated Aug. 13, 1860.

This invention has for its object improvements in the treating of hydrocarbon oils, and consists in subjecting them to the action of a solution of chromic acid, of which the odour is removed and matters separated therefrom. The process is particularly applicable for purifying the crude oils obtained by the distillation of bitumen, Rangoon tar, earth oil, and Boghead coal—which crude oils are mixtures of numerous hydrocarbons. Some crude oils are obtained from other substances, to the purification of which also this invention is applicable. For every 100 gallons of crude oil to be treated, 12½ lbs. of bichromate of potash is taken, and dissolved in 12½ gallons of water, and to this solution is added 1¼ gallons of oil of vitriol (the sulphuric acid of commerce). The solution of chromic acid which is thus obtained is added to, and mixed with, the oil—the oil being kept intimately mixed by churning or agitating it for about an hour. By this treatment, a quantity of pitchy matters and other impurities are separated from the oil, and the oil is deprived of the greater part of its unpleasant smell. The chromic acid is at the same time changed into oxide of chromium, with which the excess of sulphuric acid unites, and forms sulphate of chromium. The mixture is now left at rest until separation takes place, which is usually the case in from one to two hours. The oil then being the upper portion is drawn off into another vessel, agitated

with a solution of soda for about an hour. This is done to wash out or neutralize any carbonic acid or other acids remaining in the oil.

The solution of soda, which it is preferred to use, is made by dissolving 12½ lbs. of soda-ash of commerce in 12½ gallons of water, and adding that quantity to every 100 gallons of oil to be washed. After one hour's agitation, the whole is left at rest until the oil has separated from the soda solution, after which the oil is placed in an iron still, and distilled. The distillation is continued until the whole bulk of oil distilled over reaches ·840 sp. gr. at 60° of temperature. The distillate is to be then placed in a proper vessel, and treated as before by churning or agitating with a solution of chromic acid in water. For every 100 gallons of oil to be treated, 12½ lbs. of bichromate of potash is dissolved in 12½ gallons of water, and to the solution is added 1½ gallons of oil of vitriol. The compound is mixed with the oil by agitation for about an hour, and then the whole is left at rest until the oil is separated from the solution of sulphate of chromium and impurities. Afterwards, the oil is drawn off into another vessel, and washed by mixing or agitating it, for half an hour or thereabouts, with one-fourth its bulk of water, or one-fourth its bulk of lime-water. When the water or lime-water has completely separated, and the oil has become bright, it will be fit for use as an illuminating oil. The heavy oil remaining in the still is distilled to dryness, and may be then treated by any of the known methods for obtaining paraffine or lubricating oil.

The chromic acid used in the process above described may be obtained otherwise than from the bichromate of potash; it is however usually most convenient to employ this salt. Although it is preferred to apply chromic acid in the first place, to the crude oils (because the solution of chromic acid by removing the pitch, tar, and other impurities, from the oil, enables it to be distilled at a heat much lower than would otherwise be necessary, and so prevents decomposition taking place in the still), the patentee does not confine himself to the treatment of crude oils, as hydrocarbon oils may sometimes be advantageously treated with chromic acid, and often having been partially refined.

It is found that, after treating some crude oils with a solution of chromic acid, and distilling until the distillate or whole bulk of oil distilled over reaches 840° sp. gr., that the oil so obtained is of too dark a colour to be used as an illuminating oil. In this case, the oil is treated by churning or agitating it with 2 per cent. (by bulk) of oil of vitriol for about an hour, then allowing the whole to rest until the acid, tar, or sludge is separated from the oil. The oil is then drawn off into another vessel, and agitated with 2 per cent. of powdered quick-lime or dried chalk for another hour, or until all the smell of sulphurous acid has left the oil. There is then added 25 per cent. (by bulk) of water, and the whole is agitated for a quarter of an hour; after which time, the mixture is left at rest until the oil has become bright, when it is drawn off for use; but, if the oil is not of a good colour, it is redistilled. If there is any difficulty in getting the oil perfectly bright, there is added to every 100 gallons of oil 26 lbs. of common salt dissolved in 8 gallons of water, and the whole is agitated well together for a quarter of an hour; then, when left at rest, the oil will become perfectly bright. In no case, however, is the oil of vitriol used for treating the oil, if it can be avoided, as it unites with and decomposes a great part of the lighter oils, and this it is wished to avoid as much as possible. The chromium used in the process may be recovered either as sulphate or oxide, as desired; the sulphate of potash may be also recovered.

2009.—Edward Bridgman, of Tarragona, in Spain, gentleman, for "*Improvements in the construction of wet gas-meters.*" Patent dated Aug. 21, 1860.

The object of this invention is to insure a more correct measurement of gas than is commonly attained in wet gas-meters, and also to prevent such meters from being tampered with for fraudulent purposes. These results are obtained, first, by the use of certain improvements in the construction of the measuring-drum; and, secondly, by causing the water-gauge pipe to stand up within the measuring-drum midway, or nearly so, between its sides. This pipe will thus be so near the middle of the meter-case that the tilting of the meter in any direction will not materially change the relative positions of the water-level and the top of the pipe.

The means whereby the level of the water is maintained are the following. In the inlet-tube is a valve-seat, fitted to receive an inverted valve, which is carried by a bent rock-lever, and, having its fulcrum on a bracket attached to the casing of the meter. This rock-lever carries a saddle-shaped float, which overrides the horizontal portion of a bent gas and water supply pipe or spout, which is connected to the inlet-pipe by a branch, thus avoiding the necessity for the usual front chamber. A syphon-pipe enters this spout, which is made duplex in one part by the addition of another pipe, and reaches upwards to the height required for the water level, serving to gauge the water to that level, the overflow passing into the syphon-pipe, and thence through the open mouth of the tube out of the meter, which is then closed in the usual manner. One portion of the duplex-spout extends somewhat higher than the other, so as to secure a free passage for the gas. The mouth of the other portion is by this arrangement brought so near the centre of the meter-case as to prevent any appreciable change being effected in the level of the water, as respects the mouth of this pipe, by the dipping of the meter. Over the spindle of the measuring-drum, and within a central chamber formed therein, a saddle-shaped float rides, to which is attached a rock-lever carrying another inverted valve. The gas exit-pipe is fitted with, and set to receive, this valve; so that when, by reason of an undue supply of water, the measuring space for the gas is contracted, a tendency is given to the two valves above referred to, to rise; and, in so doing, to close both the inlet and exit gas-pipes, and stop the action of the meter.

The mode of constructing the drums of meters so as to insure steady and even movement, and a correct measurement of the gas, is as follows:—The spindle of the drum is mounted in bearings, one attached to the end casing of the meter, and the other to the vent-spout above referred to. The drum consists of an outer and inner periphery, which are connected together by the usual overlapping sides. The inner periphery forms a central chamber, which is divided by a vertical partition, so as to prevent the gas entering into the back division until it has passed through the measuring-chambers of the meter. These chambers are four in number, and are separated from each other by cross partitions, which extend diagonally across the drum. There are two openings into each chamber from the centre of the drum, the opening on the one side of the partition being for the admission of the gas to the chamber, and that on the other side for the exit of the measured gas. These openings are severally covered by an open-mouthed hood, the lips of which terminate in a line with the open lips of the adjacent side-covers of their respective chambers. Thus, these openings will remain sealed until the moment the drum, by its rotation, brings up the lip of the lateral inlet or outlet-opening of each successive chamber.

2018.—Robert West, of Walsall, in the co. of Stafford, gas engineer, for "*Improvements in the construction of wet gas-meters.*" Patent dated Aug. 22, 1860.

This invention consists, first, in the application to wet gas-meters of an improved measuring-wheel or cylinder; and, secondly, of an improved valve and float, with the modes of their adjustment.

The improvements in the measuring-wheel or cylinder consist in diminishing the widths of the cross divisions at the water-line, and making the front of the cylinder flat instead of convex, by which means the variation in the registration of wet gas-meters, caused by the variation in the height of the water-line, from evaporation, and other causes, is much reduced.

For a meter having a large number of lights, the cylinder is constructed with an internal cylinder, with the cross divisions diminished in width, where they join throughout, but so placed as to form the spaces between the leaves of the cylinder wider at the water-line than at the periphery of the cylinder, which arrangement enables the water to escape freely from the gas chambers of the cylinder. There are no openings in the periphery of the internal cylinder, and the capacity of the measuring-wheel or cylinder is the space between its periphery and the periphery of the internal cylinder and the back and front leaves.

The improvements in the valve and float consist in attaching to the valve-box a screw with one or two nuts, which screw is passed through the side or top of the front box. If the screw is passed through the side of the box, the hole is lengthened so as to allow the valve to be adjusted, and afterwards secured by the outside nut. If through the top, two nuts are required, one inside and the other outside. The relative positions of the valve and float are also regulated by a screw on the valve-rod working in a nut secured at the top of a tube which passes through the float, there being, in addition, a lock-nut to keep the parts firm after the adjustment.

PROVISIONAL PROTECTION

HAS BEEN GRANTED FOR THE UNDERMENTIONED INVENTIONS.

36.—William Mattieu Williams, of Handsworth, in the co. of Stafford, teacher, for "*An improvement or improvements in treating coal and other bituminous minerals, and peat, for the purpose of obtaining solid and liquid hydrocarbons therefrom.*" Jan. 5, 1861.

212.—John Henry Johnson, of 47, Lincoln's Inn Fields, and Glasgow, N.B., gentleman, for "*Improvements in obtaining motive power from the expansion and compression of air, gas, or vapour, and in the machinery or apparatus employed therein.*" A communication. Jan. 26, 1861.

271.—José Joaquin De Arrieta, of Piccadilly, London, esquire, for "*Certain applications of chapapote and its products, and of the same combined with other substances, and of materials treated therewith to various purposes in manufactures and the useful arts.*" Feb. 1, 1861.

NOTICE HAS BEEN GIVEN OF INTENTION TO PROCEED WITH THE UNDERMENTIONED INVENTIONS.

2370.—Charles Henry Hurst, of Victoria Terrace, Royal Road, Kennington, Surrey, Henry Horsey and George Baker, both of Bridge Street, Southwark, Surrey, for "*Improvements in syphon and other taps, or cocks employed for drawing off liquids.*" Oct. 1, 1860.

2430.—Samuel Whitaker, of Liverpool, licensed victualler, for "*Improvements in the construction of fluid taps or cocks.*" Oct. 8, 1860.

2539.—Alfred Bertrand Jacout, director of water-works, at Rheims, France, for "*Improvements in water-meters.*" Oct. 18, 1860.

3161.—Francis Puls, of 25, Francis Terrace, Hackney Wick, Middlesex, for "*Improvements in obtaining products from coal, tar, asphalte, resin, and other bituminous and resinous substances.*" Dec. 26, 1860.

36.—William Mattieu Williams, of Handsworth, in the co. of Stafford, teacher, for "*An improvement or improvements in treating coal and other bituminous minerals, and peat, for the purpose of obtaining solid and liquid hydrocarbons therefrom.*" Jan. 5, 1861.

Parliamentary Intelligence.

HOUSE OF LORDS.

Feb. 11, 1861.

The Lord Chancellor reported to the House that the Standing Orders applicable to the Dover Gas Consumers Bill have not been complied with.

The Blackburn Water; Clitheroe Gas; Dewsbury and Batley Gas; Grand Junction Water; Haslingden Union Gas; Northampton Water; Portsea Gas; South Essex Water; Southwark and Vauxhall Water; and Swansea Gas Bills, were read the first time, and referred to the examiner.

Feb. 12.

The Hastings Western Water; Isle of Wight Water; Uxbridge Gas; Wigan Gas-Meter and Fitting; and Wolverhampton New Water Bills, were read the first time, and referred to the examiner.

The Lord Chancellor reported to the Hcuse that the Standing Orders applicable to the Aldershot Gas Bill have not been complied with.

The Aldershot Gas; Tylde Water; Macclesfield Gas; and Weston-super-Mare Gas Bills, were read the first time, and referred to the examiner.

Feb. 15.

The Luton Water, and Portsmouth Water Bills, were read the first time, and referred to the examiner.

FEB. 18.

The WHITWORTH VALE GAS BILL was read the first time, and referred to the examiners.

The LORD CHANCELLOR reported to the House that the Standing Orders have not been complied with in respect of the ISLE OF WIGHT WATER, and the LUTON WATER Bills.

FEB. 19.

VICTORIA DOCKS GAS.—Bill read the first time, and referred to the examiners.

The CLITHEROE GAS; DEWSBURY AND BATLEY GAS; GRAND JUNCTION WATER; PORTSEA GAS; SOUTHWARK AND VAUXHALL WATER; SWANSEA GAS; and HASLINGDEN UNION GAS Bills were read a second time.

FEB. 21.

Petitions were presented against the SOUTHWARK AND VAUXHALL WATER Bill by the Trustees of the Surrey and Sussex Roads; and against the WHITWORTH VALE GAS Bill by the Rossendale Union Gas Company.

The UXBRIDGE GAS; WIGAN, GAS-METER AND FITTING; WOLVERHAMPTON NEW WATER; and NORTHAMPTON WATER Bills, were read a second time.

The LORD CHANCELLOR reported to the House that the Standing Orders applicable to the FYLDE WATER Bill have not been complied with.

FEB. 22.

The LORD CHANCELLOR reported to the House that the Standing Orders applicable to the STAFFORDSHIRE POTTERIES WATER Bill have not been complied with.

The ATHERTON, BEDFORD, &C., GAS AND WATER Bill was read the first time, and referred to the Examiners.

HOUSE OF COMMONS.

FEB. 11, 1861.

The EXAMINER reported that the Standing Orders had not been complied with in respect of the ALDERSHOT GAS and DOVER GAS CONSUMERS Bills, referred to the Select Committee on Standing Orders.

The RYDE WATER; UNIVERSAL LIME-LIGHT; THAMES EMBANKMENT; and BURTON-UPON-TRENT WATER Bills were read the first time and ordered to be read a second time.

FEB. 12.

The DEWSBURY, BATLEY, AND HECKMONDWICKE WATER; DUBLIN CORPORATION WATER; SOWERBY BRIDGE GAS CONSUMERS Bills were read a second time, and committed.

The NEATH WATER; and STREET RAIL Bills were read the first time, and ordered to be read a second time.

FEB. 13.

The HUDDERSFIELD GAS; LONDON TRAMWAY AND DISPATCH; SOWERBY BRIDGE GAS; and LIVERPOOL IMPROVEMENT Bills, were read a second time, and committed.

The KINGSTOWN WATER Bill was read the first time, and ordered to be read a second time.

FEB. 14.

The ELLAND GAS; MIDDLETON IMPROVEMENT; and TONGE IMPROVEMENT Bills were read the first time, and ordered to be read a second time.

FEB. 15.

The STANDING ORDERS COMMITTEE reported—That the Standing Orders ought to be dispensed with in respect of the BOLTON CORPORATION Bill, that the parties be permitted to proceed with their bill, provided that they strike out of the bill the leasing powers; that the committee on the bill do report how far such order has been complied with on the report of the bill.

FEB. 18.

The EXAMINER reported that the Standing Orders had not been complied with in respect of the CARRIAGE TRACK Bill. Referred to the Select Committee on Standing Orders.

The BURTON-UPON-TRENT WATER; KINGSTOWN WATER; NEATH WATER; RYDE WATER; and UNIVERSAL LIME-LIGHT Bills were read a second time, and committed.

PAROCHIAL ASSESSMENTS BILL.

Sir G. LEWIS moved the second reading of this bill.

Mr. HENLEY said he did not rise to oppose the second reading of this bill, but it was beginning to excite some attention in the country, and he trusted that the Home Secretary would give due time for its consideration. The bill was of a somewhat technical and complicated character, and, in the absence of any explanation to the contrary, he feared it would lay the ground of a very heavy expense. One of the clauses gave to certain persons the power of ordering maps to be made. Now, when it came to mapping a country, it was difficult to say what expense you might not run to. Some of their friends in the north, knew something of mapping on an extensive scale, and it might happen that some counties might think it desirable to have their villages mapped on a scale of from six inches to a foot. It might be desirable to refer the bill to a select committee upstairs, but in any case, he trusted the Government would allow due time for its consideration.

Mr. A. SMITH recommended that the second reading should be postponed. The bill gave the county magistrates the power of assessing every parish within the county, but before the House conferred such powers, it ought to discuss the measure about to be introduced by the honourable member (Sir J. Trelawny), for the establishment of county boards to regulate the county expenditure.

Mr. DEEDES was still of the same opinion as he formed on the introduction of the bill, that the machinery would be somewhat cumbrous, costly, and rather difficult of operation. With regard to parochial assessments, it was desirable that inquiry should take place with respect to the principle on which they were made, with the view of attaining something like uniformity. He believed that in parts of the country many acts were done which savoured more or less of oppression, in consequence of the manner in which the assessments were carried out. As it was right that parochial authorities should be well acquainted with what was meant to be done, he had intended to propose that the second reading should be deferred, and he only refrained from pressing that proposition because he advocated making progress as far as possible with government measures at an early period of the session; but it should be understood that, if the bill were now read a second time, it would be referred to a select committee, after a sufficient delay to enable parties to become acquainted with the details of the measure.

Mr. BARROW, believing that taxation and representation should go together, only consented to the second reading of this bill with the expectation that it might be so modelled in committee as to establish what ought in justice to exist—a representation of ratepayers in the boards of assessments.

Sir G. LEWIS said it was a mistake to suppose that the bill was a bill of taxation. It did not propose to levy any taxes on the people, but merely provided that the assessment on which the taxes were levied should be fixed by a board of county magistrates. The bill was brought in, in order to prevent those inequalities which arose from the present system of parochial taxation. Therefore, the dogma that taxation and representation were co-extensive had no application to the present bill. With regard to the conversion of the financial administration by county magistrates into an administration by a representative body, that subject might come under the consideration of the House at the proper time, and, if Parliament sanctioned the proposition, the present bill would naturally follow that system of administration; but he proposed to found himself on the existing state of things as to the administration of the affairs of counties by county magistrates. The principle of the bill was to provide better machinery for establishing fairness and uniformity in forming parochial assessments, and beyond that principle he did not conceive that any gentleman was pledged by voting for the second reading. (Hear, hear.) All the details of the machinery were matters for subsequent consideration in committee. With this explanation, he trusted that the House would to-night agree o the second reading. The bill had been in the hands of Members for more than a week; it was printed and distributed last session, and there had been ample opportunity to judge of its provisions. At the same time, if there was any wish on the part of the House that the bill should be referred to a select committee, he should make no objection. If that course were adopted, it would be convenient not to postpone the select committee until a very distant day, because the bill must afterwards be considered in a committee of the whole House; and, therefore, should the bill be read a second time now, he would fix the Committee for Monday week, and then it might be decided whether or not it should be referred to a select committee. If it were not so referred, he undertook to allow further time for consideration.

Mr. Alderman SIDNEY regarded the principle of the bill as a great improvement on the existing law, and thought it ought to apply not only to parochial and county rates, but to a variety of other rates which were now assessed by different bodies, and were not at all uniform. He believed the bill might be made a valuable measure, but he hoped the right honourable baronet would see the importance of establishing a uniformity in the assessment of all the different rates, and not in that of the county and parochial rates only.

Mr. E. JAMES thought the second reading of the bill should be postponed. It was extremely desirable that members should have time enough to ascertain the sentiments of those whose interests were affected by the measure, and who were most capable of forming an opinion of its particular bearings. Last year, the second reading of the Reform Bill was postponed for a month; and there was nothing so pressing in the present measure that a little delay might not be conceded. If the right honourable baronet did not concede it, he should move that the bill be read a second time that day fortnight.

Mr. PULLER approved the general object of the bill, but drew attention to some deficiencies in points of detail that he hoped would be corrected in subsequent stages; among them, were the assessment of liberties, the manner of publishing the assessment lists, and the short time allowed to put in objections. A ratepayer might object to, and appeal against, successive rates; but if he did not lodge his objection to the assessment list, under the present bill, within a fortnight, he was precluded from doing so at all. Many causes might prevent him from having any knowledge of the new assessment, and he thought the time within which objections could be made should be considerably extended.

Mr. BRIGHT said the bill had been only three or four days on the table of the House, and that, as a consequence, the various constituencies throughout the country had not, as yet, had an opportunity afforded them of considering its provisions. He might add, that a very eminent authority in the town which he had the honour to represent had written to him for a copy of the bill, stating that he was, so far as his knowledge of it went, disposed to regard it as in many respects highly objectionable; that he had complied with that request, but that he had not, as yet, had time to receive the definite opinion of the gentleman to whom he had referred on the subject. Indeed, he had not himself had an opportunity of examining the measure, and the great majority of honourable members stood, he believed, exactly in the same position—a state of things which it was not desirable should exist when the House was asked to give its assent to a scheme which dealt with matters of a very complicated and irritating character. The government seemed to have reduced the policy of doing nothing to a system this session, and they might, he thought, very well adjourn the debate for a fortnight, so that nobody who took an interest in the bill would be taken by surprise. (Hear, hear.)

Sir G. C. LEWIS observed that it was rather hard upon a member of the Government to have complaints made of his not bringing forward his measures early in the session, and then, when he did so, to have a cry raised for their postponement. (Hear, hear.) All he asked the House upon the present occasion to do was to assent to the principle of the bill, which was simply the introduction of greater uniformity into the system of parochial assessment, without pledging itself to any of its details. If honourable gentlemen would assent to the adoption of that course, he would fix the committee for Monday week, and would then be prepared, if the House were desirous that he should do so, to send the bill to a committee up stairs, which would not examine witnesses, but simply go through the various clauses of the measure. That committee would have accomplished its task, in all probability, about Easter, and then the bill would come before the House in committee, when any honourable gentlemen might take a division upon it. Nobody could, under those circumstances, be taken by surprise; and he trusted, therefore, that the House would read the bill a second time that evening. (Hear, hear.)

Mr. BARROW said it was impossible that the Members of constituencies, residing in remote rural parishes, could have an opportunity of considering the measure and reporting their opinions upon it to their representatives before the day fixed by the right honourable gentleman for the committee.

Mr. WALPOLE, referring to the remark of the honourable Member for Birmingham, to the effect that the Government seemed to have reduced the policy of doing nothing to a system, observed that it might or might not be a just one; but that what he should deprecate much more was that the House of Commons should adopt a similar policy. (Hear, hear.) About the desirability of securing the object which by the bill it was sought to accomplish there was, he believed, very little difference of opinion, however much the machinery by which that object was to be attained

might be the subject of dispute. That being so he could see no valid objection to the adoption of the course which the right honourable gentleman the Secretary for the Home Department proposed. (Hear, hear.)

Mr. DEEDES asked whether the House was to be given clearly to understand, that at the expiration of a fortnight, the bill was to be referred to a select committee.

Sir. G. C. LEWIS having answered in the affirmative, and Mr. A. SMITH having expressed a hope that no step would be taken with regard to the measure, which would have the appearance of taking the country by surprise,

The amendment was withdrawn, and the second reading of the bill agreed to.

FEB. 19.

The STANDING ORDERS COMMITTEE reported that the Standing Orders ought to be dispensed with in respect of the BIRMINGHAM IMPROVEMENT Bill; that the parties be permitted to proceed with their bill, provided that clause 78 be struck out of the said bill; that the committee on the bill do report how far such order has been complied with on the report of the bill.

The ELLAND GAS; MIDDLETON IMPROVEMENT; TONGE IMPROVEMENT; and DARLINGTON LOCAL BOARD OF HEALTH Bills were read the first time, and ordered to be read a second time.

Petitions were presented against the PAROCHIAL ASSESSMENTS Bill from Swinton, Liverpool, Kirkdale, and Great Driffield; against the DUBLIN CORPORATION WATER Bill, from the Provost, Fellows, and Scholars of Trinity College, Dublin; and against the SOWERBY BRIDGE GAS, from the Sowerby Bridge Local Board of Health.

FEB. 20.

Petitions were presented against the PAROCHIAL ASSESSMENTS Bill from Kenilworth, Runcorn, Penrith, and Leamington Priors; against the ATHERTON, BEDFORD, &c., GAS AND WATER Bill, from the London and North-Western Railway Company; against the DEWSBURY, BATLEY, and HECKMONDWICKE WATER Bill, from the Owners, &c., of Mills, &c., on the river Dun; against the DUBLIN CORPORATION WATER Bill, from Owners, Lessees, and others in Dublin; against the LONDON TRAMWAY AND DISPATCH Bill, from the Chelsea Water-Works Company; and against the SOWERBY BRIDGE GAS CONSUMERS Bill, from the Corporation of Halifax, Lancashire and Yorkshire Railway Company, Thomas Wood, and Sowerby Bridge Gas Company.

FEB. 21.

The LIVERPOOL IMPROVEMENT Bill was read a second time, and committed.

The BIRMINGHAM IMPROVEMENT and STOCKPORT DISTRICT WATER Bills were read the first time, and ordered to be read a second time.

Petitions were presented against the PAROCHIAL ASSESSMENTS BILL from Liverpool, Wavertree, Tottington Lower End, Hornsey, and Bath; against the HIGHWAYS Bill from Wickham Skeith, and Hornsey; against the DUBLIN CORPORATION WATER Bill from Earl Fitzwilliam; against the HUDDERSFIELD GAS Bill from Sir John William Ramsden, Bart., the Longwood Gas Company, the Inhabitants of Longwood, &c., Mold Green Local Board, the Gas Consumers and Ratepayers of Huddersfield, the Board of Surveyors of Highways of Marsh, the Huddersfield Improvement Commissioners, Anthony Knowles Kaye, and the Board for Repair of Highways of Fartown; against the LIVERPOOL IMPROVEMENT Bill from the London and North-Western Railway Company; against the LONDON TRAMWAY AND DISPATCH Bill from the Vestry of St. Mary, Newington, the Vestry of St. Mary, Lambeth, Metropolitan Stage Carriage Proprietors, the Inhabitants of St. George the Martyr, Southwark, and the Southwark and Vauxhall Water Company; against the MIDDLETON IMPROVEMENT Bill from the Lancashire and Yorkshire Railway Company: against the SOWERBY BRIDGE GAS Bill from the Inhabitants of Elland, Owners, &c., of property (Thomas Nicholl and others), Owners, &c., of property (Moses Morley and others), the Corporation of Halifax, Manufacturers, Merchants, &c., Mortgagees of Tolls, and the Rochdale and Halifax Road Trustees: and against the TONGE IMPROVEMENT Bill from the Lancashire and Yorkshire Railway Company.

FEB. 22.

The STANDING ORDERS COMMITTEE reported that the Standing Orders ought *not* to be dispensed with in respect of the DOVER GAS CONSUMERS Bill.

A petition was presented from the Lancashire and Yorkshire Railway Company against the ELLAND GAS Bill.

FEB. 23.

A petition was presented from the Elland Gas Company for suspending standing order 105, in respect of the SOWERBY BRIDGE GAS COMSUMERS Bill. Petitions were also presented against the ELLAND GAS Bill from the corporation of Halifax; against the SOWERBY BRIDGE GAS CONSUMERS Bill from the Elland Gas Company; and against the TONGE IMPROVEMENT Bill from the Middleton Gas Company.

TRADE MARKS.

A BILL

Intituled an Act to amend the Law relating to the fraudulent marking of Merchandise.

[*Presented by the* LORD CHANCELLOR.]

Whereas it is expedient to amend the law relating to the fraudulent marking of merchandise: be it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

I. In the construction of this Act the word "person" shall include any person, whether a subject of Her Majesty or not, and any body corporate or body of the like nature, or company or society, whether the members thereof be subjects of Her Majesty or not, or some of them subjects of Her Majesty and some of them not, and whether such body corporate, body of like nature, company, or society, be established or carry on business within Her Majesty's Dominions or elsewhere, or partly within Her Majesty's dominions and partly elsewhere; and the expression "trade mark" shall extend to and include any name, letter, mark, device, figure, sign, seal, stamp, label, or other thing lawfully used by any person to denote any chattle to be of the manufacture, workmanship, production, or merchandise of such person.

II. Whosoever, with intent to defraud, or to enable another or others to defraud, any person, shall forge or counterfeit, or procure or cause to be forged or counterfeited, any trade mark, or shall make or procure or cause to be made any imitation of a trade mark so resembling such trade mark as to be likely to deceive, or shall apply, or procure or cause to be applied, any trade mark, whether the same be a genuine trade mark or not, to any chattel, not being the manufacture, workmanship, production, or merchandise denoted or intended to be denoted by such trade mark, or to any case, cover, wrapper, cask, bottle, reel, stopper, or other thing in, on, or with which any chattel shall be intended to be or shall be sold, or uttered or exposed for sale or for any purpose of trade, shall be guilty of a misdemeanor.

III. Whosoever, with intent to defraud, or to enable another or others to defraud, any person, shall sell, or utter or expose for sale, or for any purpose of trade, any chattel, together with any forged or counterfeited trade mark, or with any imitation of a trade mark so resembling such trade mark as to be likely to deceive, or with any trade mark, whether the same be a genuine trade mark or not, which shall have been applied without lawful authority or excuse (the proof whereof shall lie on the party accused), and whether such trade mark or imitation be in, on, or about such chattel, or in, on, or about any case, cover, wrapper, cask, bottle, reel, stopper, or other thing in, on, or with which such chattel shall be sold, or uttered or exposed for sale or for any purpose of trade, shall be guilty of a misdemeanor.

IV. In any indictment under this Act with respect to a trade mark or an imitation of a trade mark it shall be sufficient to describe the same as a trade mark, without further or otherwise describing such trade mark, or setting out a copy or fac-simile thereof

V. Whosoever, with intent to defraud, or to enable another or others to defraud, any person, shall put, or procure or cause to be put, upon any chattel, or upon any case, cover, wrapper, cask, bottle, reel, stopper, label, or other thing in, on, or with which any chattel shall be intended to be or shall be sold, or uttered or exposed for sale or for any purpose of trade, any false indication, statement, or description of the quantity, measure, substance, or material of such chattel or any part thereof, or of the manner or place in or at which or of the person by whom such chattel was made, manufactured, or produced, or was or is dealt in, shall be guilty of a misdemeanor.

VI. Whosoever, with intent to defraud, or to enable another or others to defraud, any person, shall sell, or utter or expose or keep for sale or for any purpose of trade, any chattel on which, or on any case, cover, wrapper, cask, bottle, reel, stopper, label, or other thing in, on, or with which such chattel shall be so sold, or uttered or exposed or kept for sale or for any purpose of trade, there shall be any false indication, statement, or description, of the quantity, measure, substance, or material of such chattel or any part thereof, or of the manner or place in or at which or of the person by whom such chattel was made, manufactured, produced, or was or is dealt in, shall be guilty of a misdemeanor.

VII. Whosoever, with intent to defraud, or to enable another or others to defraud, any person, shall forge or counterfeit, or procure or cause to be forged or counterfeited, any name, word, letter, initial, cypher, monogram, or other mark whatsoever used to denote any picture, painting, drawing, engraving, lithograph, print, plate, model, sculpture, or other work of art to be the work, production, or manufacture of any person, whether alive or dead, or shall make, or procure or cause to be made, any imitation of any such name, word, letter, initial, cypher, monogram, or mark, so resembling the same as to be likely to deceive, or shall apply, or procure or cause to be applied, any such name, word, letter, initial, cypher, monogram, or mark, whether the same be genuine or not, to any picture, painting, drawing engraving, lithograph, print, plate, model sculpture, or other work of art, not being the work, production, or manufacture of the person or persons denoted or intended to be denoted by such word, name, letter, inital, cypher, monogram, or mark, shall be guilty of a misdemeanor.

VIII. In any indictment under this Act, when it shall be necessary to allege an intent to defraud, or to enable another or others to defraud, it shall be sufficient to allege that the party accused did the act with intent to defraud, or with intent to enable some other person or persons to defraud, without alleging an intent to defraud any particular person, or an intent to enable any particular person or persons to defraud any particular person; and on the trial of any such indictment it shall not be necessary to prove an intent to defraud any particular person, or an intent to enable any particular person to defraud any particular person, but it shall be sufficient to prove that the party accused did the act charged with intent to defraud or with intent to enable some other person to defraud.

IX. Every person found guilty of a misdemeanor under this Act, shall be liable, at the discretion of the court, to suffer such punishment by imprisonment for not more than two years, with or without hard labour, or by fine, or both, as the court shall award.

X. Nothing in this Act contained, nor any proceeding, conviction, or judgment for any act hereby declared to be a misdemeanor, shall affect any remedy which any person aggrieved by such act may be entitled to, either at law or in equity.

Legal Intelligence.

VICE-CHANCELLOR'S COURT.

(*Before Vice-Chancellor* WOOD.)

THURSDAY, FEB. 14.

POSTLE *v.* THE BURY ST. EDMUNDS GAS COMPANY.

Mr. WILLCOCK (Mr. TERRELL with him), for plaintiff: Sir, in the case of *Postle v. The Bury St. Edmunds Gas Company*, the plaintiff moves on behalf of herself and others, who are interested similarly in the Bury St. Edmunds Gas Company. The motion is this—"That the directors, the defendants, may be restrained from declaring or paying any dividend on the old or original shares" (there are two classes of shares, old and new), "until the plaintiff and other holders of new shares therein have received a dividend on their respective shares equal in amount to the difference between the dividend declared at the two half-yearly meetings in the plaintiff's bill mentioned on the said old and new shares, and, thereafter, from declaring or paying any dividend on the shares in the said company other than an equal dividend on the old and new shares until the dividend reaches 7½ per cent. on such shares." Sir, the company was constituted by a special Act of Parliament, of June 1849, with a capital of £12,000, consisting, I think, of twelve hundred £10 shares. There is nothing peculiar in that Act of Parliament, except that it does not mention what the amount of dividend is to be. The General Gas Lighting Act is the 10th of Vict. chap. 15; and in the 30th paragraph it is thus recited—"The profits of the undertaking to be divided amongst the undertakers in any year shall not exceed the prescribed rate; or, where no rate is prescribed, they shall not exceed the rate of £10 in the hundred by the year on the paid-up capital in the undertaking, which, in such case, shall be deemed the prescribed rate, unless a larger dividend be at any time necessary to make up the deficiency of any previous dividend which shall have fallen short of the

said yearly rate." Therefore, as originally constituted, the members who took shares were entitled to have a dividend declared up to £10 per cent., and not beyond that, and any excess is provided for by the Act of Parliament. It is immaterial to go into that question. The only other question that it is necessary to go into with reference to the Act of Parliament, is the scale of voting. According to the Act of Parliament, it is provided by the 17th section, that the scale of voting shall be as follows—"For one share or more, but not exceeding five, one vote; for more than five shares, but not exceeding ten, two votes; for more than ten shares, an additional vote for every five shares." Mrs. Postle became the holder of original shares to the extent of 138, and having sold five, her present interest as a shareholder of the old shares is 133 shares. The consequence of that mode of voting is, that a very great number of persons holding single shares have a great influence in carrying a measure. The bill states that those shares were paid up classified as A and B shares, but that is immaterial, inasmuch as £10 has been paid upon each share. A subsequent Act of Parliament was passed for the purpose of increasing the capital. That Act of Parliament received the Royal assent on the 1st of August, 1859, and, by that Act, it is enacted in the 30th section that the capital of the company shall be the sum of £30,000, consisting of their present capital of £12,000, and an additional capital of £18,000, by the Act of Parliament authorized to be raised from new shares. It says: "The company, from time to time, with the sanction of three-fifths of the votes of the shareholders present, personally or by proxy, at a general meeting of the company specially convened for the purpose, may raise, by the creation and issue of new shares, any further sum not exceeding £18,000, in addition to the capital, by the recited Act authorized to be raised by shares. The new shares shall be of such nominal amount as the company, with the like sanction of shareholders, shall determine, and the company, with the like sanction may determine" the times at which, and the terms and conditions on which the new shares shall be issued. Then, the 9th section provides that, "The new shares shall be part of the general capital of the company, and, except as by this Act otherwise provided, shall be subject to such provisions with respect to the times of making calls, and the amount and payment of calls and forfeiture on non-payment of calls and otherwise, as if the new shares were part of the capital by the recited Act authorized." The profits of the company applicable in any year commencing with the 1st of January for the payment of dividends, shall not exceed £7. 10s. per cent. per annum.

The VICE-CHANCELLOR: The question is, whether they have a right to make a difference between two classes of shares?

Mr. WILLCOCK: Whether they have a right to make a difference up to 7½ per cent? Here there is a prescribed amount; and, therefore, 7½ per cent. cannot be exceeded. The allegation your Honour will find in the bill is this: that the new shares were offered; that my client took 207 of those new shares, being the proportion in which, according to the general Act, they were to be offered; and that £10 per share has been paid upon each of the new shares. The whole of the shares, or almost all, have been issued. No provision was made imposing any condition upon those new shares by the company, in pursuance of the powers given; and the consequence, therefore, is that, under the 9th section, as we contend, it becomes part of the original capital, entitled to be placed in exactly the same position as the original capital, with this distinction only: that whereas the dividends on the original capital may be paid to the extent of 10 per cent, the dividends on this capital can be paid only to the extent of 7½ per cent. I need not trouble your Honour by going through the bill.

The VICE-CHANCELLOR: It is a pity this should not be turned into a motion for decree.

Mr. WILLCOCK: I am quite willing to treat it in any way that will be convenient to the court.

The VICE-CHANCELLOR: I mean, if there is a serious question. It depends upon whether there is a question to be tried.

Mr. WILLCOCK: I am ready to adopt what course the court thinks convenient.

Mr. TERRELL: There will be no difficulty in turning it into a motion for decree, except that the bill prays costs against the defendants, which would render it necessary for the defendants to put in an answer, to show the correspondence that has taken place. If we can dispose of the question of costs, there is no reason why it should not be turned into a motion for decree.

Mr. ROLT: There is some question about the costs being paid personally, and I suppose that there must be an answer put in.

Mr. WILLCOCK: My client says that it is a question raised, and the directors consider, as they have fairly raised the question, we should not press the question of costs, if your Honour thought it was a case in which the costs should be charged upon the fund.

Mr. ROLT: I am sure there is a question: at least, if you raise it, there is a question certainly.

Mr. WILLCOCK: I mean, we do not ask any costs personally, as against the directors.

Mr. ROLT: It is a question of construction.

The VICE-CHANCELLOR: It seems to be a mere question of construction.

Mr. WILLCOCK: If it is put in this mode, that the costs are to come out of the fund either way, it will be so much advantage to the company.

Mr. ROLT: If you fail, why are you to have your costs out of the fund?

Mr. WILLCOCK: If you fail, why are you to have your costs?

Mr. ROLT: We are directors—trustees for both parties.

Mr. WILLCOCK: I am willing that it should be heard now, or that it should be turned into a motion for decree.

The VICE-CHANCELLOR: There will be an additional question—whether there is such an amount of question, as to make it proper that there should be an injunction till the hearing?

Mr. ROLT: If it stands that there is no imputation against the directors, that will do.

Mr. WILLCOCK: The bill does not contain any imputation against the directors.

The VICE-CHANCELLOR: I do not see any.

Mr. WILLCOCK: The directors say, they have been advised that they have a right to do what they are doing.

Mr. ROLT: They are trustees for the old shareholders.

Mr. TERRELL: They have done the best they could: they took counsel's opinion, and acted upon it.

Mr. WILLCOCK: Your honour observes the bill does not contain any imputation upon these gentlemen, as indicating that they are acting otherwise than in accordance with their belief of whatever is best for the company; but, at the same time, if my learned friend thinks it necessary to put in answer, I am quite content that it should stand for a reasonable time to be disposed of, no dividend being declared in the meantime; those being the terms upon which it has stood over for some time past.

Mr. ROLT: We say that what we are doing is the right course, and that we have not done it arbitrarily.

Mr. WILLCOCK: Do you wish to put in an answer?

Mr. ROLT: Yes.

Mr. WILLCOCK: You will not declare any dividend in the mean time?

Mr. ROLT: Will your honour name any time for hearing it?

The VICE-CHANCELLOR: As soon as your answer is put in, any morning you like.

Mr. WILLCOCK: Any day will suit us.

Mr. ROLT: You must give notice of motion for decree.

Mr. WILLCOCK: Yes.

The VICE-CHANCELLOR: It seems a very dry question of law.

Mr. ROLT: It is, entirely so.

Mr. WILLCOCK: So it appears to me.

Mr. TERRELL: We accept notice of motion for decree now.

The VICE-CHANCELLOR: Not till the answer is in. If you put in an answer, they may want affidavits; though I cannot at present conceive why.

Mr. ROLT: We will put it in within a week.

The VICE-CHANCELLOR: And then give a notice of motion.

Mr. WILLCOCK: Then your answer may be agreed to be treated as an affidavit at once, and the court will advance the cause.

THURSDAY, FEB. 21.

HILLS *v.* EVANS.—JUDGMENT.

The VICE-CHANCELLOR: The only question which, as it appeared to me from the beginning of the case was an arguable question is, whether or not the defendant, Evans, was to have an opportunity, before an injunction could be granted, of retrying this question by means of an action to be brought by Mr. Hills against Mr. Evans—in other words, whether the burthen should be thrown on Hills of taking further proceedings to establish his patent after the successful proceedings which he has hitherto taken as against this particular defendant? Now the case, as it stands, is this. Hills has had a patent from the year 1849 to the present time, being a period of 12 years. There was an attempt made at one time to repeal it by *scire facias*, that is to say, proceedings were taken for that purpose; but those proceedings were abandoned. It is true that a certain disclaimer was entered by Hills in 1856. I do not go the length which Mr. Druce has gone, of saying that that was a confession of the invalidity of the patent up to that time, in any other sense than this, that the patent being a perfectly good patent with regard to the novelty of the invention; yet it was liable, according to the strict law of patents, to impeachment, no doubt from the circumstances of their being some other things mixed up with it which it was necessary to disclaim; but it does not lessen the value of the invention claimed after the disclaimer, nor does it lessen the important fact of the enjoyment in any other sense than this,—that having enjoyed it, and enjoyed it with benefit anterior to the disclaimer, he was apprehensive that flaws might be found in it by persons who were determined to dispute the patent, and although he had employed it up to that time without impeachment, still to prevent the possibility of his enjoyment being interfered with, he secures the continual enjoyment by the disclaimer, and the enjoyment seems to have been continuous, if such a term can be used, having regard to the litigation which was continually threatened by parties; but he seems to have received Royalties, and soon, although threatened with proceedings of *scire facias*, and though proceedings were taken by *scire facias*, those proceedings were abandoned. Well, then, at last came the great struggle between Mr. Hills and the companies, after he had put his patent in the most perfect shape, by a disclaimer. There were six or seven gas companies, all of whom conceived that they were interested in disputing the validity of the patent, thereby giving the strongest confirmation to the great value of the discovery, supposing they were wrong, because they all conceived it was of great importance to them to make use of the invention, and to show the plaintiff was not the discoverer. Therefore, the value of the use of it is put beyond all question; but they disputed the novelty, and they disputed, in some respects, whether or not what they were doing was an infringement. That being so, the plaintiff brings four or five actions, and one of those actions is proceeded with against the London Gas Company, and, the matter having been in a course of trial, the plaintiff was anxious to proceed with another action against the Equitable Gas Company; but the then Lord Chief Justice, now Lord Chancellor, declined to proceed with that action. He said there was one action pending, and he would not proceed with the action against the Equitable. Then, the course taken by the gas companies, at all events, by the defendant, with whom I have now to deal, Mr. Evans, was this:—He admits that he represented one of those companies called associated gas companies. Of that, there is no dispute. He represented one of the companies who undertook, through the medium of the defence afforded by the London Gas Company to sustain the right of the public to use this invention. That is plainly enough stated in the defendant's affidavit, because, in paragraph 24, he says, "I, and the other companies and persons in the bill mentioned, being all interested in the public manufacture and purification of gas, and being threatened with actions, and having had actions commenced against us by the plaintiff, and having since become interested as licencees or otherwise in the patent of the said F. J. Evans, agreed to resist the plaintiff's demands, which we were advised were unjust, and to defend Evans's said letters patent, and in pursuance of that agreement, and in support of our own rights, we defended the said actions," in the plural—that is to say, they all defended the actions. He goes on to say: "I, however, had nothing to do with the defence of the suit in equity of the plaintiff against the said London Gaslight Company.' I take that to be a distinct admission that the defendant, together with the other companies, defended the action against the London Gaslight Company, although he says he had nothing to do with the defence of the suit in equity. It appears still more plain as you proceed: "I, the said Charles Rogers, for myself, say as follows:—In the month of July, 1857, when actions had been commenced by the plaintiff against three of the seven companies mentioned in the plaintiff's affidavit (for four of which companies I had long previously been more or less professionally concerned), I was retained and instructed to defend the said actions, and generally in any legal proceedings to be adopted by the said plaintiff, in respect of any alleged infringement of his patent, which patent the said companies were advised was invalid." Then, we find that throughout the correspondence is addressed as solicitor of the associated companies, and answers as the solicitor of the associated companies. Then, further than that, he says: "The plaintiff's solicitor, on the 24th of October, 1860, intimated to me that his common-law counsel, who had returned to town, was unable to assent to all the alterations made by the defendants (the London Gas Company) common-law counsel in the special case; and he proposed that, with-

out again going before the judge, a meeting should take place between such counsel." Here, therefore, we have a question on the special case, which was to be submitted to the court in the action against the London Gaslight Company; and the defendant Evans's counsel is invited to attend the meeting, evidently taking a part as actors in the proceedings. Then, he says: "The plaintiff, in his affidavit in this cause, filed on the 13th day of July, 1860, stated that the question at law against the defendant in this suit awaited the result of the actions against the London Gas Company, in which the appeal was pending; and I immediately, and on the 25th of October, instructed the defendant's counsel to meet the plaintiff's counsel as proposed; and, on the 26th of October, the plaintiff's attorney informed me that the counsel were to meet in conference on the following day." Therefore, there is a clear and distinct statement that the plaintiff, in his affidavit, having stated that the action at law was abiding the event of this action against the London Gaslight Company (for I read it in this way), I accepted that view of the case, and thereupon immediately instructed my counsel to meet it. Then, Mr. Rogers says (for Mr. Rogers, the solicitor, speaks to this part of the case):—"I found that the counsel could not agree on the form of the case, and I immediately applied to the clerk of the learned baron for an appointment before him, that the draft case might be settled; but I found the judge had not then returned to town." Then, he says, the answer of the defendant in this suit was put in at such a time. Then, come the proceedings as to the intended compromise:—"I, Frederick John Evans, for myself, say I acted at the request, and on behalf of, the defendant, George Frederick Evans, in the negotiations which originated with the plaintiff in reference to the proceedings after the commencement of the appeal, and after the injunction mentioned in the plaintiff's affidavit. After many discussions with the plaintiff, and at a meeting about the 24th of October last, at the office of the London Gas Company, the requisitions and proposals made by the plaintiff, which involved the discontinuance of the appeal, and that the admission by the companies of the validity of the patent, and the further term that they should be bound to purchase the plaintiff's material, from the then present time to a period extending beyond the expiration of his alleged patent, were absolutely rejected; and it was determined and understood, that the negotiations were at an end, and that the appeal should be brought to a hearing; and the plaintiff was so informed, and I communicated this result to the said George Frederick Evans, who quite approved the same." Then, he says that, on the 30th or 31st, he left London for Edinburgh, and that, upon his coming back, he found this arrangement had been entered into. Now, that is the exact state of the case. You have the defendant clearly a party to the whole proceeding in the sense of accepting the view that one action depended on the other; and, therefore, I conclude that he was a participator in the expense of defending the action against the London Gaslight Company, and that was with the general view of defeating the plaintiff's patent; and then he is a party, also, to all those negotiations and arrangements as to what should be done with the appeal to the Exchequer Chamber, which existed with regard to the London Gaslight Company; and he concludes, no doubt, by saying that he went away from the last meeting. Although a party, he does not act alone through Sprague. I am bound to say that, on the defendant's behalf, there is no denial of how far Sprague was authorized to come to a complete conclusion, yet he does say that he did not authorize Sprague to come to this conclusion; he had a special agent attending, Mr. Frederick John Evans, his brother, watching his special interest. It is in that state of things I have to consider how far this gentleman, after his long enjoyment, after this long trial of five days, which took place at the assizes, after his success before the court in *Banco*, when a new trial was moved for, and the new trial refused, all the judges being unanimous on the point of law reserved by the Lord Chief Baron, doubting as to a certain part of the evidence adduced; and then an appeal to the Court of Exchequer Chamber being had, the principal defendant in that appeal, after calling together all those who were associated with him in the defence, together with three other of the persons interested in this contest, that is to say, four out of the seven companies proceed against—they all coming to a conclusion to settle this matter—it is in that state of things that I have to consider, whether the plaintiff has so far established his case, that I ought to secure him in the enjoyment of his patent by an injunction, without requiring him to take any further proceedings at law for the purpose, and whether or not, the sums should not be rather thrown on the defendant, who is one of the recusant defendants, to try by *scire facias* to get rid of the patent, if they think that the patent is still a matter open to controversy? That is the only question before me, because as regards the injunction, I shall act exactly as I acted on the former occasion (the case being now in a much stronger position against the London Gaslight Company, there being now a compromise and arrangement), solely on the ground of the plaintiff's success at law, and in *Banco*, although there was an appeal to the Exchequer Chamber. I thought the case sufficiently strong, to say there should be an interim injunction until the final result of the case, which rested on the determination of the Court of Exchequer Chamber was known, as well as to there being any new evidence, or any novelty in the case, since the last motion was before me, I must say I really have nothing, because I have only this fact, that the defendants had given up working under what they called Evans's process, which I held to be an infringement of the plaintiff's patent, and are now working in a manner in which they say Croll gave evidence that he worked before the date of the patent. The question then is (and the question before the jury was) whether, in truth, Croll did work in the manner he described? Mr. Grove has pointed out the conclusion to which the jury did come, and that appears also by the learned baron's statement in refusing the new trial. Mr. Grove has pointed out the reason why the jury might have come to the conclusion that Croll was using an experiment with reference to the oxide, because, although Croll said it might be so manufactured to get the oxide, he did not so apply it to the purification of gas, because, if he had so applied it, it would be contrary to the form in which he says he applied the manganese; and, he says, in his patent, he might apply it in the same modes, and that is called anhydrous, as distinguished from the hydrated. Therefore, if he had got the hydrated process, the oxide agent, by means of this experiment, that was not what he applied to the gas, but something which he got at in the course of experimenting, not as applying it directly to the gas, but as a stage towards obtaining that material which he meant afterwards to apply to the gas. It seemed to me the whole question as to Croll's patent had been, as far as the case had then gone, clearly and plainly determined by the court in *Banco*, and that subject only to the appeal on that they had established that nothing that Croll had done had invalidated the plaintiff's patent, that there was nothing in Croll's patent which invalidated the plaintiff's patent, and that the process which was being pursued by the gas company was a plain violation of the plaintiff's patent. Now, it is said that it is very hard for this defendant to be bound by anything that the London Gaslight Company have done, inasmuch as their mode of manufacture was different from his. If I found any substantial difference, that would have to be considered; but I really find upon the affidavits no substantial difference between what is in the plaintiff's patent, and what the defendant is now doing. As to the discovery having been anticipated by Heard's patent of 1806, that certainly is a most idle contention after what has been decided on Croll's patent. I am bound to say I should have thought it an idle contention, independently of any conclusion that had been come to on Croll's patent. Croll had said, "I prepare oxide of manganese in a certain way." Then he said, "besides that, you may have oxides of iron." I have the words here in the chief baron's judgment, and they are more precise than anything contained in Heard's patent. He says:—"The same effect may be produced by the application of the oxide of zinc, and the oxides of iron, and treated precisely in the same way as above described." Well now that, the judges found, was not an anticipation of this gentleman's patent. Now, Heard's specification is this. His patent is solely for the purification of gas by means of lime. He says:—"I hereby declare that my invention is fully described as follows, &c., &c." [reading down to the words]: "I slack it with lime." Then, he explains how he does that, and then he says he has detected the presence of sulphur in a great variety of coal, which, no doubt, must have been a matter of common observation long before. Then, he goes on thus:—"I present lime in substance to the sulphur as it is disengaged by heat from the coals; and, through their natural affinity, arrest it in its progress, and from sulphate of lime or hydro-sulphuret, depending in the circumstances of the operation." It was not the fashion, in those days, to have a distinct claim, but he says that is my process; but what he describes afterwards is not his process at all. He says:—"I have reason to conclude that any of the fixed alkalies or alkaline earths, such as barytes, strontian, and other similar earths, or carbonate of lime, when exposed to a degree of temperature sufficient to drive off the carbonic acid gas, might be substituted for lime; but, from economical motives, as well as constant success, I prefer the agency of lime. It must, therefore, be clearly understood that lime in substance or a dry state, the fixed alkalies or earth possessing alkaline properties, or such metals or their oxides as possess a sufficiently strong affinity with sulphur and sulphuretted hydrogen as answers the end desired, such as iron, manganese, zinc, copper, lead, &c., when mixed with the coals, laid on their surface, or put into separate vessels, through which the gas is made to pass, are calculated, in a greater or less degree, to divest the gas of the cause of the offensive smell; but I distinctly state that I have always found lime (if caustic the better) stratified with coals, and exposed to heat, the most economical and successful process." His claim, therefore, is only for lime, and what he says is this:—"I have reason to conclude that all kinds of things which will extract sulphur will do; but is that either a claim or anticipation of any discovery? That is to say, the merit of my process by lime consists in this, that the sulphur is extracted or neutralized through the medium of the lime; of course, therefore, I, as a chemist, know that anything in the world that will dispose of the sulphur will have the same effect." But the question is, whether that would be the subject of a patent or not, because there may be hundreds of things that would produce an infinitesimal effect, and I suppose chemistry has not yet ascertained that infinitesimal portion of the combination which may be made between chemical agents and re-agents: but, to tell you all that may be and may happen, is not anticipating a discovery. The man who is a discoverer, and who is entitled to a patent, is a man who discovers a process useful to mankind, and which nobody has yet applied to that particular use; and this wide guess which tells you, what all the world might have known without this gentleman mentioning it in his patent, that as one thing which takes away sulphur will have a certain effect, anything that will take away sulphur will have the same effect, but I have discovered that lime will do, and therefore I use it, is merely leaving the whole world to discover what will be successful and useful to mankind, and that discovery, it seems to me, the plaintiff (Mr. Hills), has made. Well, therefore, as to Heard's patent, it is beside the case to suppose that that could be a circumstance on which it would be proper and right to give this gentleman a fresh opportunity of trying the validity of Mr. Hill's patent. Then, the case stands thus. This gentleman has associated himself with persons to make the best defence they could against the plaintiff's claim. He has made that defence. He tells me now, as everybody says who has been defeated after a trial:—"If I had thought of a great many other things, I could have made a better defence, but I have put the plaintiff to the expense of a five days' trial. I have joined with six other companies in doing that; afterwards, when there was to be an appeal, a special case was to be settled; we attended the settling of that case; we watched the proceedings throughout: afterwards, an injunction was obtained in this court; although I took no part in settling the case, I attended, on invitation through my agent, my brother, Frederick John Evans, a consultation as to what was best to be done after the injunction and after the trial, and to consider how matters stood as to the appeal, and whether we should proceed to the Exchequer Chamber. I attended one meeting, and thought then that the thing had gone off, and that there was not to be a new trial in the Exchequer Chamber. I found, however, afterwards that, out of the seven companies with whom I associated myself for this purpose, four of them came to the conclusion that it was better to abandon the case, and now I find that it is very hard if I am to be deprived of trying my case on wholly fresh evidence, because I had associated myself with certain persons who, by a majority of them, came to a conclusion that, in that defence on which I entered, and in which defence I made the best fight I could, together with those other parties, they were in the wrong, and had better not proceed." Now really, if I were to do what this defendant asks, I should give him a great advantage. There can be no question that, had the thing proceeded to the Exchequer Chamber, this gentleman would have been as much bound, for all the purposes of the suit, by the decision, as if he had been a defendant. If a person associates with others in a defence, and makes the best defence he can, I should not for one moment listen to his saying, "I can make something better of my case than what has happened in the defendant's case, and therefore I have a right to try it all over again before the injunction is granted." It appears to me clear I should have said, "No; you having had every opportunity of making your defence, I shall not put the plaintiff under any terms, and I shall grant the injunction." The only point that has weighed on my mind from beginning to end is this—regard being had to the circumstance that the persons with whom he associated himself have abandoned the appeal—how far, on that circumstance alone, I ought to say this defendant should have the advantage of making a wholly new case, after putting the plaintiff to the expense of fighting the former case, because the appeal has been abandoned by the persons with whom he associated himself, with the consent of three others. It appears to me the last remark that Mr. Grove made was a perfectly just one—that, in that state of circumstances, the *onus* should be shifted, and that, if this gentleman wishes to try the validity of the patent, the *onus*

should be thrown on him, and he can, if he thinks proper, proceed by *scire facias*, when he can make any case that he thinks tenable. It appears to me that, within the rules of this court, the patent has been sufficiently established to entitle the plaintiff to an injunction, without putting him to further expense or fresh litigation. I shall grant the injunction in the common form—of course, it will be an interim injunction until the hearing of the cause or until further order, but without putting him under any terms.

Mr. DRUCE: I presume the plaintiff will do what was done in the other case—give us six weeks, in order to prevent the district which we supply being in the dark?

The VICE-CHANCELLOR: Yes; you will give them six weeks.

Mr. GROVE: They must keep an account.

The VICE-CHANCELLOR: That was in the former order. I observe the six weeks were mentioned.

Miscellaneous News.

PHŒNIX GASLIGHT AND COKE COMPANY.

The Adjourned Half-Yearly General Meeting of Proprietors was held at the Three Tuns Tavern, Southwark, on Wednesday, the 20th instant, J. E. JOHNSON, Esq., in the chair.

Mr. PRIDDEN (the secretary) read the advertisement convening the present meeting, also the minutes of the last half-yearly general and *pro formâ* meetings.

The following report of the directors, with abstract of trade account for the half year ending Christmas, 1860, and the balance-sheet having been printed and circulated among the proprietors previous to the meeting were taken as read:—

The directors submit to your consideration, as usual, the trade account for the half year ending at Christmas last, together with the balance-sheet at the same period.

The new retort-house at Vauxhall has been completed; about one-third of the benches, which it will contain, have been built, and the retorts are in course of being set. The amount expended on plant during the past year has been very large, and much yet remains to be done to secure for the company the means of providing that increased supply of gas which may now at any time be demanded. The execution of these works will render it necessary to increase to some extent, at no distant period, the paid-up capital of the company, by the making of further calls on the proprietors, of which due notice will be given.

The Act 23rd and 24th Vic. cap. 125, entitled "An Act for Better Regulating the Supply of Gas to the Metropolis," was passed on the 28th of August last. By it the several gas companies of London are obliged, under heavy penalties, to supply gas of a high illuminating power and great purity, to every person who may, in conformity with the terms of the Statute, require it. They are also obliged to provide experimental meters and other apparatus for testing the illuminating power of the gas, to which any chemical examiner or gas engineer, or other competent person appointed by any local authority taking a supply of gas, shall have access, at all times, on giving three hours' notice. Under this Statute, the several gas companies may be subjected to much annoyance and loss; but, notwithstanding this, your directors have determined to give to the Statute a favourable interpretation, and to put it in force in a liberal spirit, in the full confidence that by such a course they will best secure the favourable consideration of their consumers, both public and private. In accordance with this determination, and with the view of giving the consumers a participation in the present prosperity of the company, the directors have reduced the price of gas 3d. per 1000 feet, and have largely extended that part of their district in which the lower or town price is charged.

The accounts are again presented in form very similar to that which has been so long used; but, as all the London gas companies are now under the new Statute, it is desirable that there should be as much uniformity in the mode of keeping and presenting their accounts as the peculiar circumstances of each company will admit. This subject is under the consideration of the directors of the several companies, with a view to the adoption, under the direction of the Secretary of State, if he see fit, of a form of accounts, from which the actual state and condition of the concerns of each company may be accurately and readily ascertained, as well by the consumers as by the proprietors.

Your directors recommend that a dividend for the last half year, at the rate of 4½ per cent. be declared. This, added to the dividend and bonus of the last half year, will make an entire sum of 8½ per cent. divided on the capital of the company during the entire year. During the last half year, a net profit of £21,256. 18s. 6d. has been realized; from which, deducting the above dividend and the income-tax (or a total of £20,813. 1s. 3d.), there will remain a sum of £443. 17s. 3d., which, added to the undivided balance of £4237. 8s. 1d., will make a sum of £4681. 5s. 4d. undivided.

In accordance with your Act of Incorporation, the directors now resign into your hands the trust you have so long reposed in them, and they offer themselves for re-election, in the confident hope that their management has met with your approbation.

Dr. — *Abstract of the Trade Account, for Six Months, ending Christmas*, 1860. — *Cr.*

For Coals used			£27,022	4	10
Tradesmen's bills for materials supplied			7,280	7	2
Law expenses			945	15	0
Meters and repairs			1,789	13	7
Rent, rates, and taxes			1,618	8	0
Directors, £750; auditors, £50			800	0	0
Salaries			3,289	10	2
Wages paid			10,088	6	2
Bad debts and allowances			306	0	3
Investment-fund			500	0	0
Depreciation			4,278	11	0
Net profit			21,256	18	6
			£79,175	14	9

By Rental for light			£63,332	15	2
Coke made for sale			13,017	16	4
Breeze, ditto			248	7	6
Tar, ditto			1,063	15	10
Ammonia, ditto			1,315	13	10
Interest received			197	6	1
			£79,175	14	9

Dr. — *Abstract of the Balance-Sheet, at Christmas*, 1860. — *Cr.*

For Capital of 9000 £60 shares, £53 each paid up			£477,000	0	0
Unpaid dividends			259	12	3
Unpaid tradesmen's bills			12,980	4	1
Investment-fund			4,254	7	1
Balance of profit and loss—					
Undivided balance	£ 4,237	8 1			
Half year's profit	21,256	18 6			
			25,494	6	7
			£519,988	10	0

By Amount of plant at Midsummer last			£427,855	6	0
Less—					
Depreciation			4,278	11	0
			£423,576	15	0
Add—					
Expended this half year in extension of works			14,036	11	8
			£437,613	6	8
Securities for investment-fund			4,000	0	0
Amount due from sundries—					
Christmas quarter	£40,458	3 0			
Arrears	1,698	5 1			
			42,156	8	1
Amount due for coke	£3,085	10 8			
Ditto breeze	124	5 0			
Ditto tar	829	10 3			
Ditto ammonia	976	16 7			
Ditto sundries	1,071	5 6			
			6,087	8	0
Stock of coals	£6,080	16 0			
Ditto coke	51	15 0			
Ditto breeze	46	17 6			
Ditto tar	132	13 0			
Ditto ammonia	132	1 6			
Ditto retorts	1,464	19 0			
Ditto meters	15,023	2 0			
			22,932	4	0
Balance at treasurers'	£5,699	3 3			
Ditto at interest	1,500	0 0			
			7,199	3	3
			£519,988	10	0

The CHAIRMAN: Gentlemen,—It now becomes my duty to move the resolution which for many years past, it has been my pride, pleasure, and honour to submit to you—viz., "That the report and accounts be received and entered upon the minutes." In doing so, I shall say but little, because the motion itself will afford a wide field for any observations or inquiries which the proprietors may wish to make relative to the working of the company generally. We come here on this occasion under entirely new circumstances. Since our last meeting, a Statute has been passed by the Legislature, which, if I say interferes with, I do not wish to use the term at all in an offensive sense, but certainly it does affect—and perhaps that is the better term to employ—it does affect this company very extensively, as it also does every other gas company in the metropolis. Formerly, as a company, we were left to the exercise of our own discretion, and to our own convictions of propriety in the conduct of our works. We were at liberty to say whether or not we would supply a customer with gas. We were at liberty to charge such a price for gas as we thought judicious and prudent. As a trading company, of course, we were always bound by those limits which prudence and a due regard to the advancement of our interests suggested. If we had asserted any claims which were unreasonable and unjustifiable, they would at once have been resisted; and, in the end, we should have been the sufferers. But, now, all this is altered. By the Statute which has been passed, we are compelled, under some slight conditions, which are extremely liberal to the consumers, to supply any person that asks us, with gas, whether we choose or not; and the obligation is enforced by heavy penalties. With regard to the local authorities, they can claim to have their streets and roads lighted to any extent throughout our district, which they may require. The only condition is, that such lamps shall not be more than 75 yards apart, and that being so, we have no alternative but to supply them at whatever cost it may entail upon us. By the new Act, also, there is another provision, which is, perhaps, the most important of all, and that is that your profits are now limited. I quite admit that when we consider the past history of the Phœnix, and other companies, the limitation is not a very unreasonable one. It is, provided that you shall never take more than 10 per cent dividend, and that, whatever profits can be made by the judicious and successful working of the concern beyond such 10 per cent. shall not be yours, but shall become the property of the consumers of gas in the district which you supply. Consequently, the consumers may now be considered as partners in the concern; they have an interest in it; the well-being of the company is something of importance to them. We are to manage the company well, and to take, if we are successful, our 10 per cent., but all that can be made beyond that, is to be given to the consumers, not in the form of a payment, but in the form of a reduction in the charge for gas. They are, therefore, as I said, interested parties. The public bodies throughout the district are also interested in it, inasmuch, as we cannot charge for the public lamps, such a sum as we think proper, but are bound to supply them at a price which does not exceed the lowest price charged to any of our private consumers. The local authorities, have generally regarded the gas companies, as bodies in some degree under their influence, and we know that, in past years, gas companies have been very greatly dependent upon the local authorities, in the districts through which their mains pass. Any company could come into the district, with their permission, and frequently it has happened, that the companies have supplied the public lamps at a very low price indeed, for two reasons. The first object, was to get permission to come into the district themselves, and the second, to prevent other persons from being allowed to come in. And, although we as a company, never made a stipulation with any local authority that they should exclude another company, we know that it has been not an uncommon thing with some other com-

panies to enter into contracts for the public lights for lengthened periods, and to insert a clause in such contract to the effect that during its continuance, no other company should be allowed to compete with them. Or rather, it was probably put in this way; that if any other company was allowed to compete with them, such contract should be brought to a termination. Under these circumstances, the local authorities have generally been supplied with gas at a very low price; but, by the new Act of Parliament, it is provided that the public lights are to be supplied at prices which shall not exceed those charged to the private consumers. It becomes, therefore, the duty of the consumers of gas to take care that the local authorities are not supplied with gas at so low a price as will tend to prevent a reduction in the general charge for gas in their favour. I certainly trust the consumers will have a regard to this matter, and will see that it is to their interest the public lights are not charged so low as that they themselves will be injuriously affected thereby. Let the public lights be supplied at a fair, reasonable, and sufficient price, and let all share alike in the general prosperity of the concern. We have regarded, and shall still regard, the consumers as partly interested in our prosperity; and, as soon as the Statute was passed, we felt that, as an individual when admitted into a partnership expects some benefit, we should do something on their behalf. In order, therefore, to satisfy the private consumers and the local authorities that we intended to put the Statute in force in the most friendly and liberal spirit, and also in order to elicit from them a corresponding feeling of cordiality and goodwill towards us, we at once proceeded to reduce our prices. We had, for a long period, kept steadily at a 4s. 6d. price; but, although we had done that, the public had been deriving considerable advantages from us. When we first realized a little prosperity, and our dividends increased, we immediately improved our gas; and from year to year, as our dividends increased, those improvements were extended. Eventually, our gas was raised to so high a standard, that it became unreasonable and unnecessary to carry those improvements further; and, consequently, whatever additional benefit we could bestow, must be given to the consumer in another form. We therefore determined to reduce the price of gas. I am happy to say we have done so; and, though in the accounts presented to you to day there is only one quarter of a year included, during which the lower price has prevailed, it is the quarter of the year during which there is the largest consumption of gas—the winter quarter; which is considerably more than double that of the summer one. The consequence is, that it affects your accounts to a large extent; but I hope the reduction will be regarded by the consumers as a great boon, and that they will be satisfied with our proceedings in the matter. I trust, also, that we shall be able to continue the reduction; and that, though recently the price of coals, and other things, has been very high, we shall not have to go back again to our former charge. In our report, we have adverted to the fact that we have completed our new retort-house, and that, during the past year, we have expended a large amount of capital on plant. You will find, by looking at the accounts, that we have laid out no less than £14,036 of capital in the last half year in extension of works; and you will also recollect that, during the previous half year, we expended in the same way, £10,370. Consequently, in the year 1860, we spent more than £24,000 of capital in extension of works. Our consumption has increased immensely during the last few years, and, as I said before, under the new regulations, we shall be obliged to supply every one who applies to us for gas. To show what the increase has been, I may state to you that, in the account for the half year ending Christmas, 1851, which I have now before me, our rental was £31,464; while, for the last half year, notwithstanding the reduction in price to which I have adverted, the rental was £63,332. Our rental is, therefore, double what it was. This has, of course, been effected by a large increase in the consumption of gas, provision for which has necessarily had to be made. We expended £24,000 last year out of capital, which has placed our capital account in a somewhat embarrassed position; so that, at the present moment, we are in debt to our treasurer no less than £20,000 for advances. This amount in a short time will be diminished as our rental comes in, as we are collecting from £3000 to £4000 per week. You must not, therefore, regard this as a permanent and abiding embarrassment. It is not so; but still we cannot go on, nor can we complete the works we now have in hand, and which are indispensable, without raising more money from the proprietors. We will not ask for a call until the last moment, and until we see the best way in which it can be provided, but I should not be doing justice to you, nor to the directors, if I did not say that the works must be extended, and I see no mode of escape from being obliged to come to the proprietors for more capital. We make no announcement of a call to-day, and probably shall not do so next half year; but the time is rapidly approaching when we must have this further help to enable us to carry out the greatly increasing operations we have to perform. The form of the accounts is the last thing I have to advert to. You will find the present accounts differ in some respect from those of the last half year; but only slightly so. The first particular in which they differ is this—you will find no item of "Retorts used." It is very desirable, and, in fact, it is indispensable, that all the gas companies, being now under one common Act, and all being required to show such accounts as will enable the Secretary of State and the consumers of gas to ascertain what profits are made by them, should keep their accounts upon an uniform system. We have to some extent anticipated this in the present accounts, and, probably, we shall be able to carry the idea further next time. You will not, as I said, find in these accounts the item of "Retorts used." Retorts are considered implements in the trade; and, in these accounts, this item is carried into "tradesmen's bills for materials supplied." In these accounts, you have "meters and repairs;" in the last accounts, there was an amount written off for depreciation of meters. It is an alteration only in our form of keeping the accounts. We have invariably taken from the meter account, every half year, a sum for depreciation. That sum has been kept in a separate account; and to that account all new meters purchased to replace worn-out ones have been charged. We have felt, however, that probably it would create a complicity of accounts, which other companies might not like, and therefore we have now thrown all depreciation into tradesmen's accounts, and new meters and repairs appear as a distinct item. With regard to the amount of the several items in the trade account, they are very much the same as they were before. Tradesmen's bills are about £1200 more than they were last year, but that is attributable to the circumstance I have just stated. The other matters remain very much the same; and, I am happy to say that, as the result of the half year, we are able to pay you the same dividend that we did on the last occasion. And not only so, but we are able to carry a small amount to the reserve-fund, and to the undivided account also. With regard to our waste, as there will probably be a question asked about that, I am happy to state that it is very small indeed—nearly as small, though not quite, as it was last year. At Greenwich, it is a little more; but even there it is under 10 per cent., and I think such an amount is under all circumstances very satisfactory. I am not quite prepared to say that it is entirely waste, for you will recollect we measure our gas at a temperature higher than that at which it is consumed; and you know, also, what a winter we have had. So severe has the weather been, that water-mains have been frozen at 18 inches and 2 feet in the ground; and, therefore, it will not be wondered at that our gas should reach the consumers in a more condensed form than at the period when it passed through the station-meter. In some degree, what we call waste, may just be in part accounted for. I do not believe that among our consumers generally there is any large amount of plunder. Here and there, small cases may exist in which the thing occurs, but as a rule we have reason to believe that our consumers are using our gas very fairly. I will only say, in conclusion, that if the proprietors desire information on any point, I shall be happy to answer their inquiries. It is very gratifying to be able to offer you the same dividend that we did on the last occasion, and on the whole, considering the nature of this property, and that we have to deal with an article which the public will not allow to be at a very high price, I think the shareholders present will consider it is a very satisfactory dividend. I beg to move "That the report and accounts be received and entered on the minutes."

Mr. RHODES seconded the motion.

A PROPRIETOR: I think it would be very desirable that the directors should make a call at once, rather than have to borrow money, at the present high rate of interest. I have no doubt, many of the shareholders would be happy to advance money in the shape of calls.

Mr. RHODES: Shall you not want to make the call for another six months?

The CHAIRMAN: I do not know what we may want in six months time; we do not propose to make it now.

Mr. RHODES: I do not see anything in the accounts, that it is necessary to refer to, and therefore, I will pass from them. I paid a visit to the works at Vauxhall this morning, and though I did not find, as I hoped to do, the retorts ready for working, I was gratified with what had been done. The building appears to be a very substantial one. The coal stores, I was not satisfied with, and I think, if they remain in their present form, there will be a great deal of pilfering.

The CHAIRMAN: They will not remain so; they are incomplete at present.

Mr. RHODES: May I ask if the amount expended on works at Vauxhall, is all paid?

The CHAIRMAN: There is a small balance of about £3000 remaining.

Mr. RHODES: I would recommend to the directors the propriety of making the call, which they say will be necessary, at an earlier time than they perhaps have contemplated, and not to tie their hands behind them, for want of funds. There is one matter, in which I think you have acted a little prematurely, and that is in reducing the price of gas. The Act of Parliament allows you to pay 10 per cent. to the proprietors, before you lower the charge to the public, but you have made the reduction before we have received 9 per cent. I know the grounds upon which it was done, but I think you should have stood out at all events for the present. May I ask whether you find the new gasholder works well?

The CHAIRMAN: Yes, admirably.

Mr. RHODES: You do not seem to make any use of the waste piece of ground in Kennington Lane.

The CHAIRMAN: We do not think it is waste, and we are very happy to have such a place to resort to.

Mr. RHODES: Is it your intention before next winter to enlarge any of the mains in your district, and, if so, may I ask what outlay you contemplate for the purpose?

The CHAIRMAN: We do; but I can hardly give you the particulars now. We are going to bring a large main from the works at Vauxhall to Southwark; but what will be the length of it, or whether it will be an eighteen-inch or two-feet main, I can hardly tell you at present.

Mr. BOX: To what extent will the finances of the company be affected in the next six months by the reduction of 3d. per 1000 upon the gas?

The CHAIRMAN: Very little beyond what appears in these accounts.

Mr. BOX: I cannot help thinking with the last speaker that you were premature in lowering the price of gas to the public, because, independently of being allowed to divide 10 per cent., we are entitled to be paid our arrears of interest for the past six years; and I do not see how you will be able to do that, after the step you have taken. May I ask what has been the per centage of waste during the past half year at Bankside?

The CHAIRMAN: I cannot take Bankside apart from Vauxhall, as they work together. It is under 6 per cent., estimating the yield at 9000 feet per ton. At 9400 feet, it will be rather more than 10½, or nearly 11 per cent.

Mr. BOX: I have taken it at 9500 feet, and it is 14 per cent.

The CHAIRMAN: At what do you take the public lamps?

Mr. BOX: 20,000 feet.

The CHAIRMAN: We take them at 22,000 feet.

Mr. BOX: Then you are giving the public lamps more than they are entitled to receive or the Act of Parliament requires; so that you are taking from the shareholders their right, and bestowing it upon the public. With regard to the unaccounted-for gas at Greenwich, there has been a reduction of 4 per cent on the corresponding half year, which I call a very satisfactory alteration. At Bankside and Vauxhall, there has been a reduction of 2 per cent, taking the standard that I have adopted. The revenue for every 100 tons of coal at Bankside and Vauxhall has increased just 1 per cent., and at Greenwich about 6s. 9d. per cent.; so, that I think upon the whole, we are doing quite as well and perhaps rather better than some other companies. At the same time, I regret that you have made the reduction in the price of gas, for I cannot see my way at all to the payment of the back dividends; but I suppose if we get our 10 per cent. with our present price, we must think ourselves pretty well off.

The CHAIRMAN: I think so, too.

Mr. APSLEY PELLATT: As one of the directors, I am glad that the last proprietor has put facts before the meeting to show that the last half year of the company's operations have never been exceeded by any previous one. The fact is, you have placed confidence in your directors, and have enabled them to lay out money advantageously, so as to prevent waste. We have done this in various ways—first, by the erection of large gasholders, both at Greenwich and Vauxhall; and next, by increasing the diameter of the mains, and thus facilitating the distribution of gas. A few years ago, our largest main was about 14 inches in diameter; since then, we have put down a large number of 24 inches, and therefore, as you may naturally suppose, the gas meets with less resistance in its passage, and there is less waste all through the district. At the works, we have taken care that the engines and exhausters shall be in high condition, and the use of clay retorts has enabled us largely to increase the quantity of coke for sale, so that, throughout that department, there has been considerable improvement. If you will look at the accounts, you will find that the cost of coals for the half year has been, in round numbers, £27,000. It is usual with most companies to reckon upon getting back half the amount expended in coals, in the shape of products, as a very fair result. That would give us about £13,500; whereas, if you cast up the items of coke, breeze, tar, and ammonia, you will find that we have exceeded that sum by upwards of £2000, the amount being £15,645. So that, partly

from the careful attention of the directors and also from the improvement in the market for coke, we have been enabled to render this account very productive, and make up for the reduction in the price of gas, which it ought to be explained was made under very pressing circumstances. Our friends, the South Metropolitan Company, thought it wise—in fact, I believe they were driven to make a reduction in their charge under the provisions of the new Act—and therefore if we, side by side with them, had continued our former prices, we should have had many complaints from our consumers that, within a few yards of their premises, their neighbours had profited by a reduction, and they had had none. We felt that, with the improved state of things, our half-yearly dividends would not be decreased. That we were not improperly looking to the future, but were right in our calculations, the facts placed before you to-day will have convinced you. It certainly is desirable that we should keep our customers in a good humour, and let them see that we did not require to be forced by an Act of Parliament into making a reduction when practicable. While we deal with them in the most liberal spirit possible, they will have greater confidence in us, and future causes of complaint will be removed, while the consumption of gas for cooking and other domestic purposes will increase with diminished prices, and thus the company will be benefited by the extension of their supply. There is one other remark I should like to make, and that is with reference to the proposed call. Unfortunately, with gas companies, they cannot draw a line at a given point, and say we will close the capital account. You must meet the calls made on you for gas, no matter at what cost, and you cannot carry on a constantly-increasing business without continual additions to the capital. It is from this cause that the call will be necessitated. In reference to what fell from Mr. Rhodes, as to pilfering from the coal stores, I should say that it is not on the wharf that we suffer any considerable loss in that way, but on the river; and I hope that, by the arrangements which we contemplate making, we shall be able to put that down.

The CHAIRMAN: I quite agree with Mr. Box that we were not called upon by authority to reduce the price of gas. We might have retained our former rate of charge, and have paid you a larger dividend; but I cannot help thinking the proprietors, generally, will feel that we have exercised a wise discretion by securing the goodwill of our customers by permitting them to share in our prosperity. And it should be remembered, we do not ask the proprietors to make any sacrifice for the purpose, because we are paying you the same dividend as we have done before. I confidently hope, though I do not consider the present dividend a bad one, that we shall be able to do even better than this; and, when we do so, I hope the proprietors will be disposed to do a little more for the consumers, too. With regard to the pilfering at Vauxhall, it is a subject which has occupied the attention of the directors. There is a right of way which, at the next visit our friend pays, will, I hope, be closed up; and thus I hope any liability of this kind will be got rid of. The coal stores, to which he has also referred, will shortly be completed, and will not then be open to any objection on his part.

The motion was then put and carried.

Mr. GIBBES (Deputy-Chairman): Gentlemen—The next business on the paper is the declaration of a dividend. It has been confided to me to move the dividend; and in doing so, I must say that I have considerable satisfaction, inasmuch as, though the cost of coals, and other expenses, have been very heavy during the past half year; and though, as you will have observed from the balance-sheet, we have written off the usual depreciation of £4278, we are able to offer you the same dividend that we did in August last, and this, too, although we have reduced the price of gas to our consumers 3d. per 1000 feet. With regard to the items of the trade account, there is only one that I need touch upon, and that is the apparently extraordinary increase in the law expenses. In accounting for this, I should tell you that included in that item is a portion of the expense incurred in defending your interests in opposition to the bill which was brought into Parliament last year. This is an item, the larger portion of which, I hope, will disappear from the accounts of the next half year. There is one item in the account upon which I certainly must offer you my congratulations, and that is the "Bad debts and allowances." When you consider the extent and nature of the district which we supply—extending from Wandsworth to Greenwich on the south side of the Thames, and remember the poverty of a portion of that dense population—I think you may well be astonished that upon a rental of £63,000, in six months, the bad debts and allowances amount to only £306. It is a matter upon which I feel that I may fairly congratulate the company, and upon which I think you may feel confidence in reference to the mode in which your large rental is collected. Our undivided balance during the last half year has been very much depreciated. It was between £12,000 and £13,000, it is now only £4000; but then you must remember that out of that we have paid a call of £1 per share for the proprietors. In reference to the reduction in the charge for gas, I may state the effect has been that, at the last examination of the collectors before the finance committee, there was an absence of all complaints throughout the entire district, which, considering the severe season we have had to pass through, is a matter of great satisfaction. I shall conclude my remarks by proposing "That a dividend for the half year ending Christmas last, at the rate of £8. 10s. per cent. per annum (which is now, you will understand, payable upon £53 instead of £52), be now declared upon the capital of the company out of the profits of the undertaking free of income-tax, and that the same be payable as heretofore immediately after the business of the meeting has terminated, and afterwards at the company's office, at Bankside, on Thursday, the 21st instant, and also on Monday the 25th instant, on both days from the hour of twelve till three, and from that time on Wednesdays only, from two till four o'clock."

Mr. BOX seconded the motion, which was put and carried unanimously.

The CHAIRMAN: The duty of the directors for the past year is now at an end, and we place ourselves again in your hands with the confidence that our conduct has been such as to meet your approval. We are very grateful to you for the confidence reposed in us, and for the kindness we have always received from you.

The Chairman having vacated his seat, Mr. Grattan was called upon to preside *pro tem.*

On the motion of Mr. Bentley, a very cordial vote of thanks to the Chairman, Deputy-Chairman, and Board of Directors for their past services was agreed to.

Mr. JOHNSON returned thanks for himself and colleagues.

The SECRETARY having read that section of the company's Act, which refers to the election of directors, and their qualification for office, the retiring directors, Mr. Tudor, Mr. Pellatt, Mr. Tilley, Mr. Johnson, Mr. Boyson, Mr. Horner, Mr. Forrest, Mr. Fall, Mr. Gibbes and Mr. Smythe, were severally re-elected, and Mr. Johnson appointed chairman, and Mr. Gibbes deputy-chairman of the company for the ensuing year.

The two latter gentlemen returned thanks for themselves and colleagues.

The retiring auditors were also reappointed, and Mr. Box having returned thanks for himself and Mr. Bailey, the proceedings terminated.

THE EUROPEAN GAS COMPANY (LIMITED).

An Extraordinary Half-Yearly General Meeting of the Shareholders of this Company was held on Wednesday, the 20th of February last, at the Offices of the Company, Frederick's Place, Old Jewry—SHEFFIELD NEAVE, Esq., in the chair.

The notice convening the meeting was read; and, the minutes of the preceding meeting having been read and confirmed, the SECRETARY read the following report:—

Gentlemen,—Many new shareholders having joined the company during the last year, it may be advisable to repeat for their information that the half-yearly meeting has been established in order to report and discuss the general progress of its business up to the 31st of December; all statements of accounts being necessarily deferred until the annual meeting, held after the 31st of March, at which period the financial year terminates.

Amiens.—Increase of lights, 282. Business in this town continues to improve, and the increase of consumption is such as to afford ground for satisfaction. Several new factories have been opened; others have been enlarged; and the prospect of further development appears encouraging. The only work of importance at this station was the renewal of the framework of one of the gasholders, and this has been effected at a moderate cost.

Boulogne.—Increase of lights, 1023. This, being the most important increase which has taken place in the like period since the establishment of these works, cannot fail to prove satisfactory, both as regards the present and future. It should be observed that the above-stated number includes 470 lights at the new theatre, opened in June last; and, which, after a long negotiation with the authorities, your directors have undertaken to supply at a reduction on the price charged to ordinary consumers. This arrangement was the result of a compromise with the mayor, who, as elsewhere, advanced an inadmissible claim, to consider the theatre as one of the municipal buildings, which, according to contract, are supplied at the price of public lights. The town, after a period of some depression, both as a summer resort and as a place of trade and manufactures, shows symptoms of considerable activity. Public works are being conducted on a large scale. Foremost amongst them are the new docks, to the opening of which the inhabitants are looking forward hopefully, as also to the construction of a new establishment, comprising large assembly rooms, for which funds have been voted by the municipal council, in order to afford visitors every attraction usually held out to them at favourite bathing-places.

Caen.—Increase of lights, 1032. Your directors anticipate that the financial results of this station, for the whole year, will fully confirm the favourable impression which this statement must necessarily produce. The new coal store was finished in the autumn, and made available at once; thereby enabling your directors to discontinue the employment of stores formerly held on hire, but which, being situated at some distance from the works, occasioned considerable inconvenience both of expense and loss of time. Additional storeage for gas being considered indispensable for next winter, your directors have resolved to invite tenders for an iron tank and gasholder, 60 feet in diameter and 20 feet deep, which will be ample for many years to come.

Havre.—Increase of lights, 599. This statement is limited to the lights on the district held by the company, without reference to the newly-acquired part of the town purchased from the French company, respecting which your directors have now to report. After a long and anxious negotiation, which has occupied a period of eleven months, your directors obtained possession of the whole of the property on the 24th of December, and paid the purchase-money on the 12th of January last. The difficulties which had to be overcome were unusual and great. Notwithstanding a distinct agreement for purchase and sale, it was broken by the acceptance of an offer from the representatives of another French company. The parties, however, failed in raising the required capital, and fresh negotiations were entered into with your directors. The completion of the contract subsequently agreed to was made conditional on the assent of the municipal council to the concentration of the lighting of the town in one set of works. This, apparently, the sellers afterwards considered would not be obtained, for they again entered into a covenant to convey their property to other parties. But the good-will of the authorities having been conciliated by timely concessions, bearing principally on the price of public lights, the assent of the council was thereby secured to the transfer of the exclusive privilege of the French company for forty-six years unexpired, and this company were released from the obligation they had contracted of building additional works. Time has been allowed for adapting the new purchase so as to render it adequate for manufacturing the entire supply, and the concession signed and ratified by the competent authorities. Your directors are now devoting their earnest attention to the consolidation of the company's business in Havre, so as to realize, at the earliest possible period, the advantages that may reasonably be expected from careful and economical management applied to the lighting of the whole town. The outlay for extension and alteration of works will be considerable in accordance with the estimates, as also for revising the system of mains, and connecting the works with the two gasholders that are to remain on the old station.

Nantes.—Increase of lights, 2854. It should be observed that the increase of lights, properly so called, is only 1331, and the balance of 1523 is represented by 30,476 holes used in various apparatus for cooking and heating by gas—20 holes being taken as equivalent to one light. Cooking by gas is evidently viewed with more favour here than in any other city or town in France. In order to conduct this new department beneficially and with spirit, your directors determined to open premises in one of the best parts of the town for the exhibition and sale of cooking-stoves and apparatus, as well as ordinary gas-fittings. This establishment has proved entirely successful, and a large business has been done. Measures are being taken by the local authorities to prepare for the national exhibition announced to be held here next summer. It cannot fail to prove advantageous to your interests.

Rouen.—Increase of lights, 395. Trade having been exceedingly dull here, owing to the effect on cotton manufactures, consequent on the commercial treaty between England and France, the results, up to the present time, can hardly be considered as satisfactory. Another source of depression has arisen from alterations made in the management and arrangements of the workshops attached to the railway at Sotteville, in consequence of which, work has been partially suspended there during a great portion of the year; a considerable consumption of gas has thus been temporarily lost to the company. Amidst these unfavourable circumstances, it is pleasing to remark that the fittings business continues to yield good results, evidencing thereby that there is no falling off in the general progress of the business of the town. The new coal store was finished in time to receive a great portion of the winter stock.

Summary.—Total increase of lights, 6185. Although freights have ruled unusually high, and the price of coals at the pit's mouth was raised in October by 9d., and in some cases 1s. per ton, the full weight of the increase has not fallen upon this company, because a great part of the provision of the year was made, as usual, during the summer months, when freights and the cost of coals were comparatively somewhat lower. The additional expense has, however, been considerable, and is but partially met by the extra price realized for coke during the severe frost. The increase of business, however, during the year has been such as to lead to a reasonable expectation that the final result of the financial year, after providing for all charges of interest and otherwise, will show a satisfactory increase over that of 1859–60.

The shareholders seem to be fully alive to the advantages offered to them from the loans agreed to be raised on debentures, in payment of the purchase-money of the Havre Works, and have most readily availed themselves of the invitation to the extent of £30,600. The amount of cash paid on account of purchase and stocks being £34,200.

A further sum of £14,000 will be required to meet the impending outlay—principally at Havre and Caen—and your directors will be ready, at any time in the course of the ensuing four months, to receive applications for allotments of any portion of the same.

The usual half-yearly dividend, at the rate of 6 per cent. per annum, was made payable to the shareholders on the 1st instant.

The CHAIRMAN then said: Gentlemen, this report, I think, as it professes to do, gives you a general outline of the circumstances, which have chiefly influenced the operations during the past half year. You are aware, that we cannot give you figures, because the 31st of March is the time to which we make up the accounts; but I think we do not go too far, though we have hazarded something in alluding to the prospects of the termination of the

present year, when we say that at this period, though two months have yet to elapse, we see our way to an improvement over last year. (Hear, hear.) We are not often guilty of prophesying, but we think we shall not over-step the line of prudence in saying that much. The report, you will observe, shows that each town has made steady and satisfactory progress; and that the only town in which we have not a satisfactory account to give at this moment, is Rouen. You will readily see that the cause of that disappointment is rather of a temporary nature, inasmuch as the agitation of the commercial treaty necessarily disturbs commercial men's undertakings, and is a reason for, perhaps, a less enterprising people than ourselves not moving so actively under such circumstances. When those circumstances have found their level, the effect, I have no doubt, will be increased prosperity. The minor case of the lights of the railway being not so remunerative as usual, also arises from a temporary cause; because, of course, as soon as the workshops are put in activity, gas will be needed. That, I think, is all I need say as regards the towns we have hitherto had charge of. It now remains to allude to the principal feature, which is the late acquisition of half the town of Havre. We before explained to you, how desirable it was to have the concentration of two businesses in one, because in all cases that would necessarily be a matter of economy, but still more so in the case of lighting a town. Many of our shareholders are not aware, perhaps, how we have arrived at that position. We originally went to Havre in the early stages of our embarking capital in France, and we had then the whole town, such as it was. It never was much lighted in the early stages; and in those periods, the question of gas lighting being a doubtful one, no company sought, for fifty years, exclusive privilege. It was not deemed advisable to ask for it, nor would the authorities, in the uncertain state of their minds, have granted it; therefore, we were necessarily exposed to competition afterwards. That competition, I must say, arose, or rather a great deal was made of the national feeling, against foreign capital coming in; and, at that time, there was an excessive jealousy as regards the English. We also, then, had a person at the head of affairs there, who was "John Bull" himself, and did not do much to allay that feeling. I mention that, because that really was the origin of the first competition that we had to deal with. The town united against us, and a French company was established, getting agreements for terms of years, which at least gave them a starting; and they added to it by taking Graville Station, where the works are now. The competition then became serious, from which we suffered for several years. Three years ago, the town determined to divide the whole into two parts, and retain both the companies. Our mains, which had been intermixed before, were then severally taken up, and we retained each our distinct half. The French company worked it unsatisfactorily to their shareholders, and a large portion of the shares, which had been purchased in the interim, during their distress, by some bankers, were sold to one individual. In the spring of last year, overtures were made to us by this party, who, having got three parts of the shares in his own hand, had, by the rules of the society, the power of binding the minority. He came and offered to sell. He was here in England for a week, and we negotiated the sale of it with him. He met his company's shareholders, with a view to confirm that sale. At that time, another party stepped in, offering better terms. Notwithstanding his agreement with us, which, though not binding actually in law, was an honourable one, he took advantage of this larger offer, and, throwing his weight into the scale, accepted the supposed benefit. We were apparently, therefore, excluded; but time went on, and circumstances occurred to prevent this party being able to raise the money. He then had the grace to come back again to us. I went over to France, some of my colleagues who would have gone being unwell, and there I had a stiffish negotiation again with the same party. At last I agreed, that the contract should be entered into —what the French call a "*sous-seing*," which is the first preliminary contract; and that he should call upon his co-proprietors to accept the offer. In making that arrangement, I stipulated that we should not be bound, supposing the town, in giving their consent, which was absolutely necessary to complete this, should exact such conditions as we should not be willing to agree to. Of course, had I bound myself to take the offer, the town would have had a *carte blanche* to do what they liked; therefore, I was obliged to make that arrangement to retain our safe position. A meeting of the shareholders took place, and it was agreed that a liquidator should be appointed, and that liquidator was the very person who had had these two negotiations with myself and the board. The arrangement was fixed for a date when the town should have given their consent. I saw the mayor when I was there, and all seemed to be very smooth, and it appeared that they were anxious that we, who had done justice to the town, should have the preference. That was, so far, complimentary; and the Mayor was sincere, inasmuch as he strongly promoted the union. Another party, in the meantime, thought that it was too valuable a thing to let go at the price we offered; and he went to our friend who had had those two negotiations with me, and persuaded him again to sell a third time to him all his shares, which he did, the other holding him harmless against any law suit with us. The other party who made this agreement did us sufficient harm in working up the town against us, and raising questions which otherwise would not have been raised; and caused the town, no doubt, to put heavier conditions upon us than they otherwise would, thinking that he should be able thereby to prevent the contract being carried through. However, in that he was disappointed, though I cannot compliment him on the mode in which he flinched from the agreement which we, in order to put the matter straight, agreed to: that is, there was a sum of £10,000, which was a deferred payment, and that we agreed to pay down, which will account for our wanting more money at this moment. However, he totally failed in his attempt to get possession of the half part of the town; and I think the town were not very much inclined to approve of the mode in which it was done, which was so far to their credit. The consequence was, that the meeting of the shareholders, which took place a second time to confirm the old arrangement, appointed him necessarily liquidator, inasmuch as the previous liquidator, having sold his shares, ceased to be a member of the company; and he, acting under that, transferred to us the property, and bound himself to see that no other proprietor, or anybody else, interfered with us, taking upon himself the individual responsibility over and above the responsibility of the company, thereby putting an end to all these vexatious proceedings. I can assure you, gentlemen, that it has been a period of extreme anxiety and great complication of difficulties—difficulties which it is needless for me to detail; but I hope that you will feel that we have not been wanting in meeting, as far as we could, all the difficulties as they arose. I have also to congratulate you that, notwithstanding those difficulties, we have at last arrived in port. With regard to finance, the shareholders have already paid £30,000 down; there are more yet applying, and we shall allot the remainder as offers may be made during the next three or four months. If any proprietor wishes for further information upon any subject I shall be happy to furnish it.

Mr. HUGGINS said he gathered from the chairman's remarks that the contract was concluded between the company and the party who had been named liquidator, and he should like to know whether the company retained the power of charging at the rate which they had heretofore done. From the report which had been read, it appeared that there was an increase of something like 6000 lights during the half year, and from that the shareholders could readily work out the result, provided always that the same scale of charges continued during the present half year as previouly.

The CHAIRMAN said in most of the towns they were actually bound by the terms of the privilege granted to them as to the sum they should charge; therefore, the terms were fixed, and the company had made no deduction whatever from them, except now and then to a large customer they might, perhaps, give a discount, though the tariff remained untouched. With regard to the town of Havre, a reduction had been made on public lights, which was so much in reduction of the tariff.

Mr. HUGGINS remarked that that would not affect the private lights.

The CHAIRMAN replied that the only difference with regard to private lights was, that the old tariff obliged the company to reduce the price of the private lights one centime about three months hence, and that three months had been anticipated.

Mr. J. BROWN (a director) said the prices were intact all through the stations.

A resolution for the adoption of the report having been moved and seconded, passed unanimously.

Mr. HUGGINS said he could not help expressing what he believed would be the feeling of all present, the thanks of the proprietory to the chairman and directors for the extreme labour and the great results, financially, which appeared to be arrived at for the interests of all. He should, therefore, move—"That the meeting present to the chairman and the directors its most sincere thanks for the trouble and anxiety which they had experienced during the past half year."

Mr. J. G. HAMMACK seconded the motion with much pleasure, and it passed unanimously.

The CHAIRMAN returned thanks on behalf of his colleagues and himself for the honour which he conceived the vote had conferred upon them. He said he considered it not only an individual satisfaction to feel that they could look to their proprietors for approbation, but it was pleasing to know that the board generally were so much in harmony with the shareholders.

Mr. J. BROWN begged to be permitted to say one word upon a topic upon which the chairman, perhaps, with his usual modesty, could not speak. There had been, as the proprietors had heard, a most important negotiation with regard to Havre; most important as regarded the anxieties of the directors on behalf of the proprietors, and most important as regarded the permanent beneficial results to the company. They were mainly indebted to the chairman for having sacrificed a very valuable portion of his time, at a very inauspicious period of the year, in going over to France, and also because in consequence of the chairman's position here in the Bank of England, he had commanded for the company an attention, and a respect from the Mayor at Havre, to which otherwise the company would not have been entitled. The chairman had put aside, not only his public engagements, but that which was of much greater importance, his delicate state of health, and he considered that the company was very much indebted to Mr. Neave, and his influence, and to his good sense, his indomitable perseverance, and his determined resolve to maintain the honour and integrity of the English company. The chairman was accompanied by their secretary who, knowing the impress of his (the chairman's) mind, was thus enabled afterwards to carry through the arrangement in all its intricacies, but he was happy to say that those intricacies and difficulties which existed, were now at an end. It should be borne in mind, that last year the increase of lights amounted to 600, and this rendered the negotiation with respect to Havre the more important, because they all knew that Havre was the Liverpool of France, and they could anticipate what some three or four, or five years hence Havre would be, to all the benefits resulting from which they were indebted to the chairman.

The CHAIRMAN, having briefly acknowledged the compliment thus paid to him by Mr. Brown, said it was due to another party to say that, though he (the chairman) had initiated a great deal and laid the foundation for the completion of the negotiation, yet it was one which required a great deal of care, and, though he had the benefit of constant daily communication, by letter and by telegraph, with the secretary, which of course made the views of the board intelligible, and guided him in part, yet Mr. Backler had brought an unusual degree of zeal and ability to bear, in the absence of which the difficulties might have been insurmountable. He considered, therefore, that they were greatly indebted to their secretary, who had evinced a talent and a tact equal to greater undertakings. He therefore begged to move "That the thanks of the company be given to Mr. Backler."

Mr. W. S. DEW (a director) seconded the motion, and, in doing so, said it would be quite unnecessary to add anything to what the chairman had said. The board felt that they had a very active and efficient assistant in Mr. Backler, and he was sure that those among the proprietors generally who knew him would readily endorse that sentiment.

Mr. J. G. HAMMACK said he had hoped, when Mr. Brown brought the matter of the Havre negotiation before the meeting, he would have suggested that some higher testimonial should be awarded to Mr. Backler than a mere empty vote of thanks. He would submit to the chairman whether now was the proper time to bring forward a motion upon that subject; but, at the present time, when so much depended upon the integrity of the officers, he thought it would be altogether unjust if they did not tender Mr. Backler something more substantial than an empty vote of thanks. He would leave it to the chairman to say whether now was the proper time to press forward that subject, or whether it should be deferred till March; but he pledged himself that, at their next meeting, the subject should not be overlooked.

The CHAIRMAN said he thought it had better be left to the directors, but he was glad to hear the feeling of the proprietors upon it.

Mr. HAMMACK said he was quite willing to leave it in the director's hands.

Mr. BACKLER begged to thank the proprietors sincerely for such a valuable and flattering remark of their confidence in him. Certainly, last year had been one of unusual difficulty, circumstances having obliged him to pass five months of it in France; but he never put his own convenience in competition with the interests of the company, and if he succeeded in what he undertook, the pleasure of success was the greatest satisfaction he could receive. The proprietors might depend that he would always do whatever lay in his power to promote the interests of the company, in which he felt as much bound up as if it were all his own.

After a few remarks from Mr. Brown, with reference to the £15,000 of unappropriated debentures, the business of the meeting terminated.

METROPOLITAN GAS SUPPLY.

Metropolitan Board of Works.

Friday, Feb. 15.

At the usual weekly meeting of the board, this day—Mr. Tewaites in the chair,

The Clerk laid before the board a case and the joint opinion of the Solicitor-General and the standing counsel, as to the mode of carrying out the provisions of the Metropolis Gas Act, with respect to the payment of the expenses of that Act, the questions submitted being as follows:—

"1. Whether the Metropolitan Board are to assess all the parishes and districts, or only those which remain after excluding the parishes, and parts of parishes, comprised within the limits of the Gas Supply Acts enumerated in the schedule to the Metropolis Gas Act.

"2. Whether the City of London can be assessed for any portion of those charges.

"3. Whether Woolwich is or is not subject to the like assessment."

"Opinion.

"We are of opinion that the expenses in question must be defrayed by the Metropolitan Board of Works out of the funds which they are required to levy upon the whole of the vestries and district boards of the metropolis, and that there is no exception in favour of those vestries and district boards having jurisdiction within the limits of the Acts referred to in the 5th section of the Metropolis Gas Act, and enumerated in the schedule. The circumstance that the provisions of that Act are by the 5th section declared not to apply to the companies there referred to; and that the 'districts' of such companies are not to be included in the expression, 'the metropolis,' does not, in our opinion, furnish any ground for exempting them from the operation of the 56th section, which in terms applies to 'vestries and district boards' generally.

"But we think that the liability to contribute to those expenses is limited, by the language of the Act, to those bodies which strictly fall within the description of a 'vestry,' or 'district board;' and that as that description is not applicable to the Corporation of London, no part of those expenses can be levied upon the City. This view of the case is borne out by the general tenor of the Metropolis Management Act, which throughout its provisions carefully observes a distinction between the City of London and the other portions of the metropolis.

"We also think that the Local Board of Health of Woolwich, constituted under the Public Health Act, and subjected to the Metropolitan Board, 'in lieu of the vestry of the said parish" (sec. 238), is not a vestry or district board within the meaning of the enactment in question, and that that parish cannot be made liable for any portion of the expenses referred to.

(Signed) "W. Atherton.

"*Temple, Feb.* 7, 1861. "E. H. Woolrych.

Saint Olave's Vestry.

The Vestry-Clerk drew attention to certain statistics on the subject of gas by Mr. Hughes that had appeared in the *West End Examiner*, and pointed out errors therein as respected their parish. Mr. Hughes stated that there were 117 lamps in the parish, paying 95s. each, whereas the legal charge should be 92s. 6d. only, whereby there was an excessive total charge of £14. 12s. 6d. Now these figures only alluded to one (the London) out of three companies supplying the parish. The price really paid per lamp to that company was only 90s., being 2s. 6d. per lamp, or a total of £14. 12s. 6d. beneath the legal standard, according to Mr. Hughes. That gentleman also stated that 82s. 2d. ought to be the price for the Phœnix, and 86s. 9d. for the South Metropolitan, and the parish paid 85s. and 84s. respectively.

Wandsworth District Board of Works.

The Clerk laid before the meeting the replies he had received from the vestries and district boards in the metropolis as to what course they intended to take in reference to the appointment of a gas examiner under the Metropolis Gas Act. From these replies, there did not appear to be any vestry or district board willing to co-operate with the Wandsworth Board in appointing Mr. Hughes to that office.—No resolution was come to by the board in reference to this subject.

St. George's, Hanover Square, Vestry.

Thursday, Feb. 21.

Mr. Dowden brought forward a motion asking the vestry to appoint some competent person or persons as gas examiners. His object was to have some one appointed who would put the various clauses of the new Act in force. Mr. Dowden then gave an instance where Dr. Aldis had tested gas of the London Gas Company, and found it extremely impure on the premises of the gas company, who had evidently made no sufficient effort to test or to purify their gas. On the suggestion of Mr. Leslie, the report of Dr. Aldis on the impurities of the gas supplied by the London Gas Company was read. The report stated that the gas was impure, and of low illuminating power.

Dr. Appleton said it was only competent under the Act to appoint one efficient person. He hardly thought that a physician, however competent to test gas, could also test meters, for that would be shortly one portion of the examiner's duty.

Mr. Leslie said some one had been doing the duty—there was nothing to pay for it, and what more did they want? They had no power over the quality of the gas after it had been sent 1000 yards from the company.

Dr. Appleton said that was not so.

Sir J. Shelley said it was wrong to say that the Act had failed before the vestries had done their duty. The Act required that one competent person should be appointed, and it was the duty of the vestry to appoint one, and only one, competent person. He called on the vestry and on Mr. Leslie to give the Act a fair trial. The Act must be obeyed, right or wrong; if the gas consumers were not benefited, but found the gas companies practising "dodges" to deceive them, then an Amended Act might easily be obtained. He was of opinion that Londoners had been for years poisoned by the gas. The gas companies had repudiated the charge indignantly; but here was a case produced which vouched for the fact.

Mr. Mowatt thought it was not becoming for the parish to be left in the hands of one amateur gentleman or another; they ought to appoint a thoroughly competent man at once.

Mr. Ingle thought the vestry ought to give every facility for the working of the Act.

The motion was carried.

On the motion of Mr. Robinson, seconded by Mr. Watts, Dr. Aldis was requested to accept the post of gas tester. Some discussion arose as to the remuneration.

Sir J. Shelley thought it would be advisable, first, to ascertain the duties to be performed before a scale of payment was decided upon.

Dr. Appleton reminded the vestry it had happened that a larger salary had been fixed on one occasion, when it turned out that duties were much less than anticipated.

Mr. Leslie said if complaint were made to Dr. Aldis, the charge of Dr. Aldis would be half a guinea. He thought it would be advisable first to ascertain the number of half guineas during the year, as that would give them some clue to the remuneration that ought to be given.

After some further discussion, the motion was carried.

A notice was read from the Equitable Gas Company that, in future, the charge per street lamp would be £4 1s.

Mr. Hughes and Mr. Leslie.

A letter was read from Mr. Hughes, the honorary engineer to the gas delegates, referring to some remarks made by Mr. Leslie, and reported in the *West End Examiner*, in which he was, as asserted, charged with receiving £220 from his own vestry for services rendered in connexion with the Gas Bill, and the result of a motion at the Metropolitan Board of Works on the subject, in which a resolution had been passed to the effect that there was no foundation for Mr. Leslie's statement. The whole case has been published in this journal.

The Vestry-Clerk having read this part of the business, asked permission to read a communication he had received from the Metropolitan Board of Works. It had reference to the charges made by the gas delegates for expenses incurred in withstanding the new Gas Bill. The bills were now before the board, and the items appeared to be as follows:—

Mr. Beal, sundry expenses	£2685	0	0
Mr. Dangerfield, vestry-clerk of St. Martin's.	83	0	0
Mr. Wyatt, parliamentary agent, £3667—less paid, and charged in Mr. Beal's account, £1413	2254	0	0
	£5022	0	0

The committee to whom the bills had been referred had requested Messrs. Dyson to submit them to the taxing-master, and the vestry were apprised that the day fixed for taxing the bills was Monday, at eleven o'clock. It was further stated that Messrs. Dyson would attend and conduct the taxation, as the agents of the board; that vestry-clerks might attend; and that, if occasion should arise, they would be examined. Should the vestry desire to take steps in connexion with this taxing of the bills, they were requested to let Messrs. Dyson know.

Mr. Leslie said he would address himself to Mr. Hughes's communication. It was hardly necessary he should occupy their attention more than five minutes. His statement—which had excited Mr. Hughes—was that, while a member of the vestry, Mr. Hughes was employed by his vestry, and paid £220. He contended then, and he adhered to his opinion, that Mr. Hughes was not in such a position with his vestry as he ought to have placed himself. The rhodomontade of the board, that he intended to convey to St. George's vestry the impression that Mr. Hughes had been paid this money for obtaining the Gas Bill, was not worth notice, for the bills were not paid up to that moment. The *West-End Examiner*, which ably reported the proceedings of that vestry, and of other vestries, had exonerated him from the charge; and, in one of its articles, had stated that it could not see what the Metropolitan Board of Works had to do with a question of this nature. When the motion came before the Board of Works, he went out purposely, to see how many would vote in the majority, it being then the fag-end of the day. Mr. Hughes at first voted, but it was thought advisable to scratch out his name. Mr. Bidgood also voted, but his name disappeared from the list. This, then, was the combination who were to stop the taxation of the bills. He was on the finance committee of the board, and he was in favour of every district board and every vestry having notice that the bills were to be taxed, so that, if any charge was found to affect them directly, or indirectly, they might oppose it. Messrs. Dyson, however, had been appointed by the board, and the arrangements were so managed that the vestry-clerks were only to be let in as witnesses if they were wanted. They were not to object to the bills, although there was one amounting to £2600, and he would ask Mr. Dowden if he did not object to sign that bill?—aye or no.

Mr. Dowden did not think he ought to be required to answer a question put so categorically.

Mr. Leslie would then answer it for him. He did refuse to sign it, and Mr. Bertolacci did sign it; but whether on his own account or Mr. Dowden's, time would show. Here was a pretty combination of atoms to blackwash him. In St. James's Vestry, which was the focus of these doings, there was a motion under discussion to discontinue the services of Mr. Hughes, and a notice appeared in the *West End Examiner* of a charge of £172 sent into Chelsea, by Mr. Hughes, and the ratepayers there wanted to know what steps were requisite to get rid of him. He believed Mr. Hughes was also before his own board on a similar question, and he was glad to find that St. George's had escaped from him. If Mr. Dowden refused to sign the bill, as he had stated, he must have had good ground for doing so; Mr. Bertolacci, however, was less squeamish, and signed the bill. Next Monday was fixed for the taxing day, but he did not think that law laid down by Mr. Dyson would then be maintained. He should like to know whether they ought to pay £1000 for copies of the evidence which was printed before the committee met? However, the question would be gone into next Monday.

Mr. Robinson did not think the vestry could go on discussing a matter not regularly before them.

Mr. Walton said the statement on one side had been read, and it was but common fairness to allow Mr. Leslie to make his reply. He was glad to hear that Mr. Dowden had refused to sign the bills.

Mr. Westerton moved that the letter lie on the table.

Sir J. Shelley thought that some notice ought to be taken of the letter from the board. He was favourable to the principle of taxing bills, for the more they were looked into the better he was satisfied. He should move that the solicitor be instructed to attend the taxing-master.

Mr. Dowden advised the vestry not to run their heads into mischief or to spend money needlessly.

Mr. Leslie said that, if the vestry did not take action at once, they would be in the position of consenting parties to the charges. It was important that some one should appear on behalf of the parish. They must recollect the bills were only going to be taxed by the Board of Works, not by the parties who had to pay the money.

Mr. Bennett considered that the parish would be sufficiently protected by Messrs. Dyson being there.

Mr. Walton hoped Mr. Leslie would attend the board to protect the interests of the parish.

Sir J. Shelley said, in all such cases where great monopolies were to be assailed, expenses must inevitably be incurred. Now, it was originally

agreed that the bills should be referred to the Metropolitan Board; but had the vestries so lost confidence in that board as to refuse to intrust this duty to them, or to desire to appoint Mr. Leslie to do that for them which ought to be done by the board? Recollect that the time was coming when the Government would think that local self-government was not popular. There were plenty of enemies ready to take advantage of present dissensions. He would withdraw his suggestion relative to appointing a solicitor to attend the taxation of the bills, as it would show want of confidence in the Metropolitan Board of Works.

Mr. LESLIE could not consent to allow Sir J. Shelley to withdraw his motion. Sir J. Shelley was the treasurer of the Metropolitan Board. The bills had been taxed already, and Mr. Beal wished the bills to be paid at once on that taxation. Circulars had been sent round to the vestries, but that would not do, and the legal mode of taxation was to be resorted to. He felt sore that the City should have to escape payment of any of the expenses, and that St. George's should be proportionately burthened.

Mr. DOWDEN denied that a circular had been sent round to the vestries urging them to pay the bills.

Mr. LESLIE: You brought the circular here yourself.

Mr. MOWATT thought that Sir J. Shelley ought to be allowed to withdraw his motion. If they were to watch their representatives—the Metropolitan Board of Works—let it first be shown that this want of confidence was deserved. He thought it was unworthy of that vestry to look with such a jealous eye into the cost of a contest which had been gallantly fought and eventually won. He very much regretted to see the persevering attempts to throw discredit and to inspire distrust towards the Metropolitan Board. That board was composed of their own representatives, and he would remind the vestry that their own words would be hereafter quoted against them as proof that local self-government had proved a failure. He thought this habit of censuring the board ought to be given up, for it would be difficult to estimate the consequences that would possibly flow from such unwise and unwarranted conduct.

Mr. WALTON said, if Sir J. Shelley's motion was withdrawn, he should press his original motion.

Leave was then given to Sir J. Shelley to withdraw his motion.

Mr. WALTON's motion was negatived.

The VESTRY-CLERK informed the vestry that the gas contracts were about to expire.

Dr. APPLETON said the vestry ought to have the opinion of Dr. Aldis to ascertain how far the £4. 1s. per lamp was a fair, reasonable amount.

ST. JAMES'S (WESTMINSTER) VESTRY.

TUESDAY, FEB. 21.

MR. HUGHES'S APPOINTMENT AS GAS ENGINEER.

Mr. STRAY moved that the works superintendence committee should at once dispense with the services of Mr. Samuel Hughes. He had not brought this matter before the vestry out of any unkindness to Mr. Hughes, but simply because he thought that the longer they employed Mr. Hughes, the worse position they would find themselves in. Mr. Hughes had been instrumental in bringing about the new bill, the effect of which was positively injurious. Mr. Stray then, as an example, showed that his own private consumption, for a certain term in 1861, had been, with the same burners, 50 per cent. more than for the same period in 1860—a considerable proof that the bill was not a measure showing much wisdom. Mr. Hughes's remuneration, at twelve guineas (?) for a day of ten hours, was far too high. He was not a gas engineer, but a civil engineer, and many gas-fitters were better acquainted with the subject than he was. With regard to the disputes between the parish and the gas companies, he thought the question would be far better arranged by a committee of their own vestry.

Mr. WATKINS seconded the motion.

The Hon. F. BYNG supported the motion, as he could find no benefit from the services of Mr. Hughes.

Mr. GEESIN spoke on the same side.

Mr. CRANE hoped the resolution would not be carried, which would imply a censure upon their own committee. Mr. Hughes was not working for the vestry now, and he did not believe his charges would amount to £20.

Mr. COMPTON opposed the motion.

Mr. HARRISON considered that the committee would be unable to deal with the question of gas satisfactorily without the assistance of Mr. Hughes or some other scientific man. He deeply regretted the absence of Mr. Beal from their meetings, pronouncing a high panegyric upon that gentleman's acquirements and abilities. If the vestry abolished the services of Mr. Hughes, they would virtually abrogate their previous decisions, and take away the power of carrying on the discussion with the companies, especially in the absence of Mr. Beal.

Mr. DUFF thought that, if Mr. Hughes' charges were only £20, it was £20 lost to the parish.

After some remarks in reply, the motion was put and carried.

ST. PANCRAS VESTRY.

The VESTRY-CLERK read a notice that St. Pancras was to be called on to pay between £300 and £400 as its proportion to the expense of obtaining the Metropolis Gas Act, amounting to £5123, but stating that the bill was to be taxed.

Mr. DOUGLAS wished to know how it was that they were called on to pay this amount, when they had already paid £100? They should have a committee of inquiry, to see who had swallowed up this £5000 for an Act of Parliament which was not worth five farthings.

Mr. BRETTINGHAM said a gas gentleman had informed him that the promoters had got a clause in the bill to make the parishes pay this money. This was a just retribution on those who wish to ruin gas companies, and cared nothing for the widows and orphans of the shareholders.

Mr. Ross denied the assumption of Mr. Brettingham, that those who had stood against the gas monopoly desired either to ruin gas companies, or deprive widows and orphans of their shares; and maintained it was a perfectly legitimate object to go to Parliament to protect themselves and the public. They had a right to take steps for preventing the gas companies riding roughshod over them, and Mr. Brettingham's observations were therefore ill-timed and uncalled-for.

Mr. ELDRIDGE understood that when the parishes paid the moneys apportioned to them by the bill, they would have the sums already subscribed returned to them out of it. It was done to compel those parishes which would not subscribe voluntarily to do so; and be believed that, when St. Pancras vestry paid this £300 or £400, they would have their £100 already paid returned to them, or deducted therefrom.

It was resolved that the solicitor, Mr. Cooper, should attend at the taxing of the bill in question.

EXPLOSION OF A GASHOLDER AT THE PRESTON GAS WORKS.

A painful sensation was created throughout Preston, on Tuesday the 19th inst., on its becoming known that a serious explosion had taken place at the Lawson Street works of the Gas Company, by which considerable damage was done to the property of the company and to the adjoining houses, and through which several persons have received serious injuries. On the original gas works in Glover Street and Avenham Lane becoming too small for the requirements of the town, the company purchased land in Walker Street for the erection of an additional manufacturing station and further storage. On the demands of the town needing further supplies land was purchased adjoining the Walker Street station, a plot bounded by Higginson Street on the north, Green Street on the south, North Street on the west, and Lawson Street on the east. This station, which is called the Lawson Street station, had on it, until last year, two gasholders. To allow of further extensions the company a few years since purchased the site of the Old Factory in Moor Lane, where a large manufacturing station is being constructed, and to afford storage for the gas manufactured there as well as at the adjoining stations, a large gasholder has been recently erected by Messrs. J. and J. Horton, of Smethwick, near Birmingham, at the Lawson Street station. This gasholder, which was approaching completion, was 100 feet in diameter, on the telescope principle, and upwards of 40 feet deep, and it was capable of containing 340,000 cubic feet of gas.

Messrs. Horton had agreed to complete the gasholder by Christmas last, and about that time gas was delivered into it, but there were some defects in its working, and their workmen have been engaged since that time in remedying these, and in putting the finishing touches to various parts of the apparatus. In order to test its working, and its capability of rising and falling with its stock of gas, atmospheric air had been pumped into it; there being at the time some gas remaining in it. Some of Messrs. Horton's workpeople were engaged on the holder; one of them heating some rivets for another to drive into the sides. At this time the upper lift was at its highest point, having been tilted to allow of the riveting on the lower lift, and on its oscillating, probably from the wind, which was rather high at the time, a stream of gas issued from the holder, and came in contact with the heated rivet, or with the fire at the portable forge adjoining. This communicated with the mixture of gas and atmospheric air in the interior of the gasholder, and the result was a fearful explosion. This was about twenty minutes to eleven o'clock. The noise was that of an appalling earthquake; and it was accompanied by the rising of a huge volume of flame which was seen over a vast distance, causing great consternation.

Immediately following the noise of the explosion there was the fall of the mangled mass of the gasholder itself. John Winsper, who had acted as Messrs. Horton's foreman during the construction of the gasholder, was on the top of it at the time of the explosion. Immediately after the occurrence he was found suspended by his neck from the top, his body hanging inside, having fallen through a rent caused by the explosion. He was so firmly wedged in that crowbars had to be taken to extricate him. When got out he was attended to by Mr. Haldan, surgeon, and Mr. Smith, surgeon, who, after applying some means of temporary relief, directed him to be sent to the House of Recovery, when it was found that his jaw bone was broken, and one of his legs broken in two places. Another of Messrs. Horton's workmen, W. Mann, who at the time was engaged with the rivets, through which the accident occurred, is very severely burned. Two of the company's workmen are also seriously injured—Thomas Slater, a person employed in the purifying department, and William Warburton, a fireman. Slater was scraping one of the pillars of the holder when the explosion took place; Warburton was at work near the gasholder. A young man, of the name of Thomas Lingard, was in the yard at the time, with a cart and two horses, having just received a load of gas lime. The cart, the horses, their harness, and the young man were soon in a blaze. He was removed to his own house, in Haydock Street, severely injured. The horses, which, with the cart, belonging to Messrs. Watson and Breakell, brokers, are also much hurt. Slater and Mann were both taken to the House of Recovery, as well as Winsper; Warburton was taken to his own house, in Lodge Street. Mr. Dixon, Mr. Pilkington, and Mr. Rigby have been in attendance on the sufferers. Slater, who is the worst burned, managed to get to the shop of Mr. Walker, chemist, Friargate.

The gasholder, after the accident, appeared a frightful wreck. The lower lift was forced out of its bed, was much broken, and appeared like a scuttled vessel. The upper lift was rent in various places, and was bent and crumpled by the explosion as if it had been merely so much paper. Two of the columns were broken, and all the girders more or less injured. One of the other gasholders in the Lawson Street yard received but a slight injury, only a chain being broken by the concussion, but the other gasholder was rent, and gas escaping from some of the fissures took fire. The flames were, however, speedily suppressed by the application of moist clay to the apertures. Mr. James Smith, the superintendent of the works, in that part of the town, was in the "trap-house" immediately adjoining the gasholder at the time of the explosion. One of the windows of the building was blown in, and the floor torn up. The flames also reached inside, but he only suffered a slight singeing of his hair. The effects of the concussion was not confined to the premises of the Gas Company. There is scarcely a house in Lawson Street but has had its windows shaken out; in several instances the window frames as well; and several houses have had their ceilings broken and their walls cracked. Strange enough, the glass from the windows in Lawson Street has been thrown towards the gasholder, a distance of between twenty-three or twenty-four yards; the cause of the glass going in that direction being that the concussion forcing the air from the neighbourhood of the gasholder caused a vacuum, which the air in the inside of the houses sought to supply. Green Street, Walker Street, North Street, Elizabeth Street, Patten Street, Snow Hill, Appleton Row, Vicar Street, Saul Street, and others in the immediate neighbourhood, were also sufferers in numerous panes of glass being broken, in the walls being shattered, and the slates loosened. The concussion was felt throughout Friargate, Lune Street, Fishergate, and to even a wider range on the north side of the town. In Friargate, two shops had each a window broken.

Mr. Rofe, the engineer of the company, had only left town a few minutes before the accident occurred for a sojourn of a few days in the south. He was telegraphed to at Stafford, and immediately returned to Preston, along with one of the contractors for the eretion of the gasholder, to whom also a telegram had been sent. Mr. Green, the recently appointed engineer of the company, was telegraphed for to Bolton, and he promptly set off to Preston. Hopes are entertained that, serious as are the injuries of some of the unfortunate men, no lives will be lost. As respects the damage to property, the estimate can as yet only be a random one, perhaps £2000 or £3000; for which, as the work was still in the contractors' hands, we presume they are liable.

The event has naturally caused great excitement, not unmixed with alarm. The Preston Gas Company have been hitherto very fortunate in being free from such catastrophes.

ON THE MANUFACTURE OF OXYGEN AND HYDROGEN.

By MM. Sainte-Claire Deville and H. Debray.

[Abridged from the *Annales de Chimie et de Physique*•]

(*Continued from page* 99.)

Oxygen.

Nitrate of Soda.—Berzelius quotes saltpetre as one of the substances from which oxygen is easily extracted. M. Balard has further remarked, that the nitrite of soda, obtained as a product of the incomplete decomposition of nitrate of soda, may be as well and economically employed as the nitrate in the production of nitrous vapours, which serve, in the sulphuric acid chambers, to fix the oxygen of the air on to the sulphurous acid, for the purpose of transforming this latter gas into sulphuric acid.

We therefore thought it necessary to experiment upon this substance only, for the purpose of informing ourselves as to the facility with which it can be treated, and to study the composition of the gases which result from its calcination at a low temperature. This heat ought to be such as to produce nitrogen gas in insignificant quantities only. The production of nitrous gas, which takes place at the commencement of the operation, is inevitable, but this gas, being soluble in water, may be collected and turned to advantage. As to the protoxide of nitrogen, its presence corresponds to a loss of nitrous acid abstracted from the soda, which becomes free, and of which the value is less than that of the nitrite, which must be preserved, at whatever cost or risk of leaving a considerable portion of nitrate in the residue still undecomposed. One kilogramme of the damp crude nitrate of soda of commerce, introduced into a mercury bottle, gave, when heated to a dull red of about 700°—

1st, Nitrous vapours.
2nd, Gas of a high combustion-supporting power . . . 120 litres.
The composition of this gas was—

Oxygen and a small quantity of protoxide of nitrogen .	74·2 „
Nitrogen	25·8 „
	100·0 litres.

The fire was withdrawn at the moment when the gases began to be very rich in nitrogen. The alkaline residue contained a great deal of nitrite and very little nitrate. The action on the retort was very slight. The operation takes place rapidly, from the moment when the decomposition commences, and great precautions are required if a large quantity of nitrate of soda is used.

Nitrate of Baryta.—Of course, we tried the process of M. Boussingault for the extraction of oxygen from the air by means of baryta. The beautiful experiments of M. Boussingault himself (see *Annales de Chimie et Physique*, 3rd series, vol. xxxv) left little to do in a theoretical point of view. But we desired to find out the conditions under which the operation should be carried on on a large scale, and it will be seen that they are very simple.

Decomposition of Nitrate of Baryta.—The decomposition of nitrate of baryta produces nitrous vapours, protoxide of nitrogen, and oxygen. The resulting gas possesses strong combustion-supporting power, and may be used in the fusion of platinum, its calorific effects being almost in the proportion of its richness in oxygen. We took some melted nitrate of baryta, which we introduced into an earthenware retort placed in a furnace, and communicating with a large Liebig's bulb-tube of the capacity of three-quarters of a litre, which we had constructed out of small globes of the eighth of a litre, united together by tubes fused by the blow-pipe. This tube contained a soda lye, so concentrated as not to lose any trace of humidity by the passage of the gases, which themselves were dry, because we were operating upon melted nitrate of baryta in large fragments. The gases collected under bell glasses, or, in a graduated gasholder, were measured at the pressure of the atmosphere.

In operating upon 200 kilogrammes of nitrate of baryta, we obtained 5·80 grammes of nitrous acid vapours and 47·55 litres of gas. The pressure of the atmosphere was 760 millimètres, and the temperature 24°; 114 grammes of baryta remained in the retort. The gas generated during the last stages of the distillation gave on analysis—

Protoxide of nitrogen	1·6
Nitrogen.	37·2
Oxygen	61·2
	100·0

The gas obtained by the whole operation gave on analysis—

Protoxide of nitrogen	1·0
Nitrogen.	32·3
Oxygen	66·7
	100·0

It is clear, from this operation, that nitrate of baryta is entirely decomposed at a temperature of dull redness; that it gives in the form of nitrous vapours a quantity of acid capable of saturating 10 per cent. of the baryta which remains as residue; that it evolves combustion-supporting gases, which may be employed pure or mixed with oxygen for the fusion of platinum; and, lastly, that 1 kilogramme of nitrate of baryta gives 238 litres of these mixed gases, or 192 litres of oxygen, either pure or mixed only with protoxide of nitrogen. We would here remark that protoxide of nitrogen, according to the experiments of MM. Favre and Silbermann, gives out a greater heat during its combustion than would the oxygen it contains; its use, therefore, is probably quite as advantageous as that of pure oxygen.

Preparation of Binoxide of Barium.—We operated upon 5 kilogrammes of anhydrous baryta, which we introduced into a mercury bottle, pierced at its two extremities with holes, into which gun-barrel tubes were inserted. The air was conducted from a pair of bellows into the bottle, heated to redness by coke, and escaped by one of the gun-barrel tubes in such a manner that we could collect a certain portion for analysis.

We should here remark that good results cannot be obtained when considerable quantities of baryta are employed, and that it is absolutely necessary the baryta should be free from nitrate or nitrite, and, in general, from all fusible substances. In all our operations, which were conducted with the precautions indicated by M. Boussingault, we obtained on the large scale results certainly less advantageous than his, but still agreeing very nearly with those which may be found in his memoir. We were, however, obliged to apply to our apparatus a much greater heat, in consequence of the thickness of the stratum of substance employed; and were obliged to give up the use of air saturated with humidity to revivify the oxide of barium.

If the air contains much humidity (as considerable portions are passed through the apparatus), hydrate of baryta is formed; the caustic baryta becomes impregnated with it, loses its porosity, and, in the end, becomes pasty to such an extent that it cannot be extracted from the mercury bottles. With apparatus having a large surface, and containing a small quantity of the substance, similar accidents need not be apprehended, because the heat is necessarily less intense.

Under these conditions, the absorption of the oxygen of the air is less perfect; and, as a means of all our experiments, we have deprived the dry air of a third of the oxygen it contained in saturating the baryta almost exactly. The quantity of dry air which it is necessary to pass through the apparatus for the intermittent production of the binoxide of barium and the manufacture of 50 cubic mètres of oxygen (this oxygen is very pure), would be about 700 cubic mètres, according to our experiments upon 5 kilogrammes of baryta. The apparatus itself would be very simple. It would be composed of four bottles, arranged and heated as those used for manganese. To operate with certainty, two furnaces and two complete systems of apparatus are necessary. The revivification of the binoxide takes a greater length of time, and requires more fuel than the decomposition of the same oxide when the furnace is working at a suitable temperature.

We should not have hesitated to employ this process for the preparation of the enormous quantity of oxygen we consumed in our experiments, and should not even have been deterred by the cost of the nitrate of baryta which is found in commerce, if it had not entailed upon us the necessity for expending a still larger sum in the apparatus destined for the decomposition of the nitrate of baryta. This is a very difficult operation; it requires the employment of cast-iron vessels of large capacity; and this question, which appears to us to be the only one requiring to be studied at the present time, would not perhaps have been solved in a laboratory like that of *L'Ecole Normale*, so well as it would have been in a manufactory where there were thick cylinders of cast iron, such as are used in the manufacture of nitric acid. It is in vessels like these that the decomposition of nitrate of baryta should be effected. The baryta obtained in iron vessels is strongly blackened, but the quantity of oxide of iron corresponding to this intense discolouration is very small. With this difference, it resembles the baryta of our laboratories.

Sulphate of Zinc.—The sulphate of zinc, produced in voltaic batteries, is a substance for which a use is now sought. Hitherto, no one has proposed to employ it as a source of oxygen, which it, nevertheless, furnishes with great facility, as is proved by the following experiments:—

We took the sulphate of zinc of commerce, which we dried, and then introduced into an earthenware retort. The gas produced in the retort was carried through a small platinum tube, cooled by a current of water, into a sulphurous acid washer. Sulphurous acid, one of the products of the decomposition of the zinc salt, is there condensed, and the oxygen is conveyed through a meter into a graduated gasholder. The retort should be heated to a little brighter red than is required for the decomposition of manganese. At the end of the operation, there will be found a very light oxide of zinc, of a slightly yellow colour, and which only contains traces of acid. A little water is distilled; and, at the end of the operation, a small quantity of fuming sulphuric acid is found in the platinum tube. The retort is perfectly intact after the operation, as the oxide of zinc combines with silica with very great difficulty. The temperature employed was not sufficiently strong to fuse the cinders of the furnace. We estimate it at about that of the fusing-point of silver—that is to say, a bright red.

The following are the results of these operations:—

Crystallized commercial sulphate of zinc	1000	grammes
Dried at a temperature of 200° or 300° (it still contained about 3½ per cent. of water)	582	„
Oxide of zinc remaining	287	„
Of this oxide of zinc there was taken	100	„
Which, on being washed, left dissolved, sulphate of zinc .	0·70	„
From this, the oxygen obtained was	38	litres.
The calculated yield of oxygen was	38·7	„
Loss in oxygen, per cent.	0·2	

The residue consisted of—

Oxide of zinc.	99·3
Sulphate of zinc	0·7
	100·0

We thought that, by adding pounded clay to crystallized sulphate of zinc, and making a mixture which liquified at 100°, and became very closely blended, on drying we should have obtained better results; or, rather, that we might have lowered the temperature at which the decomposition took place considerably. That it was not so, will be seen by the following experiments:—

1.—Crystallized sulphate of zinc	1000	grammes
Clay	300	„
The dried mixture	905	„
Oxygen obtained	35·7	litres.
Residue of clay and oxide of zinc	551	grammes.
Undecomposed sulphate of zinc	4	per cent.
Loss in oxygen	7·9	„
Sulphuric acid condensed.	3·9	„
2.—Crystallized sulphate of zinc	1000	grammes
Clay	680	„
The dried mixture	1150	„
Sulphate of zinc which escaped decomposition .	7·4	per cent.

With sand, we obtained still more unfavourable results. By heating two parts of dried sulphate of zinc and one part of siliceous sand to a red heat, we only decomposed 64 per cent. of the sulphate of zinc, and very little silicate of zinc was formed. Thus, according to our experiments, 100 kilogrammes of the anhydrous sulphate of zinc will give 6·8 cubic mètres of oxygen, which is considerably more than the best manganese of commerce, leaving a useful residue (for paint or for the manufacture of zinc) of 51 kilogrammes of oxide of zinc, and producing 22 kilogrammes of sulphurous acid, for which a use may be found in the manner hereafter stated.

Sulphuric Acid.—Sulphuric acid has the property of being completely decomposed at a nascent red heat, into sulphurous acid and oxygen. Sulphurous acid is very frequently employed in the arts, either in the state of a saturated aqueous solution, or as sulphite of soda, or as the hyposulphite of soda, which is obtained by means of sulphite of soda and sulphur. For all these uses sulphurous acid, pure and free from nitrogen, is obtained through the decomposition of sulphuric acid by a reducing body. It was, therefore, natural to endeavour to produce sulphurous acid, making use at the same time of the oxygen.

After reflecting well upon the subject, we saw that as oxygen produced

from manganese was so costly, that we might obtain the gas profitably by the decomposition of sulphuric acid, even when losing the sulphurous acid. In reality sulphuric acid of 60° (specific gravity 1·69), produced from pyrites, costs only 5 or 6 francs the 100 kilogrammes, and as these 100 kilogrammes contain 64 kilogrammes of anhydrous acid, producing 13 kilogrammes or 9 cubic mètres of oxygen, it follows that the oxygen taken from the sulpuric acid costs scarcely 66 centimes the cubic mètre (14s. 9d. per 1000 cubic feet), which is much less than from any other known substance, except, perhaps, sulphate of zinc. Besides this, the equivalent of sulphurous acid in the sulphites and hyposulphites having a much higher value than the equivalent of anydrous sulphuric acid of 60°, it may be conceived how an industry which uses pure oxygen may produce sulphurous gas as one of the residual products of its manufacture.

These reflections induce us to recommend manufacturers who can improve their productions by employing oxygen, to consider this gas for the future as being within their reach, by the ease with which it is obtained and, above all, by the price of its equivalent, which is 6·3 times less than that of chlorine, this gas being worth 66 centimes the kilogramme $\left(\frac{8}{35{\cdot}5 \times 1{\cdot}43} = \frac{1}{6{\cdot}3}\right)$

It is clear that, if we could borrow oxygen directly from the air, it would become an article of daily use. For artificial illumination in particular it might be most beneficially employed to obtain a very brilliant light. At Messrs. Rousseau Brothers' manufactory of chemical products in Paris, we have seen powerful lamps burning which were fed by oxygen gas, the cost of which was inconsiderable in comparison with their illuminating power. This gas, nevertheless, was manufactured on a small scale in their own works from manganese, and did not cost less than 10 francs the cubic mètre, at which price it was sold in india-rubber bags.

The great specific gravity of oxygen in comparison with lighting gas, the facility with which it may be confined within a receiver similar to those in use for portable gas, and its perfect harmlessness, will, we hope, lead to experiments such as our labours have shown to be possible.

[Then follows a further description of apparatus employed by Messrs. Deville and Debray in their experiments which, as in the previous instances, we omit as being unintelligible without the illustrative drawings.]

The following is the result of one of our experiments:—

Specific gravity of acid used	1·825
Volume of acid	1·65 litres.
Weight of acid	3·1 kilogrammes.
Oxygen produced	300 litres.
Oxygen which should have been produced, had the decomposition been complete	314 „
Acid undecomposed	4½ per cent.

Composition of the original acid—

Anhydrous acid	2·26	kilogrammes.
Water	0·75	„
	3·01	„

	Kilogrammes.	Per Cent.
Anhydrous acid which escaped decomposition	0·102	11·9
Water of the original acid	0·750	88·1
Weak acid collected	0·852	100·0

of which the specific gravity was 1·10, and the strength 17°·5 Baumé.

Another experiment, made the same day, in the same time, and with a greater speed, gave us less favourable results:—

Acid used	4·31 kilogrammes.
Oxygen obtained	400 litres.
Oxygen which should have been obtained, had the decomposition been complete	452 „
Acid undecomposed	11½ per cent.

Composition of the acid collected—

Anhydrous acid	27·4
Water	72·6
	100·0

the specific gravity being 1·25.

There is, therefore, a certain speed, according to the size of each apparatus, which must not be exceeded if the best possible results are desired.

With regard to the cost of this oxygen, it should be calculated according to the price of sulphuric acid.* In allowing 7 or 8 kilogrammes of coke or coal as fuel for each cubic mètre of gas, we shall obtain a maximum which will not give more than 1 franc per cubic mètre (22s. 3d. per 1000 cubic feet) as the cost of the gas, labour included.

Hydrogen.

[The hydrogen used in the course of the experiments was produced by the decomposition of water in retorts filled with coke, and heated to a high temperature in the usual manner adopted in this country for the manufacture of "water gas." When produced at the rate of 304 litres an hour, the composition of the gas was as follows:—

Hydrogen	53·3
Carbonic acid	6·5
Carbonic oxide	40·2
	100·0

When produced at the rate of only 240 litres an hour, the composition of the gas was—

Hydrogen	52·5
Carbonic acid	5·0
Carbonic oxide	42·5
	100·0

It is stated that gas of this description, used in the manufactory of M. Christofle, cost 3s. 4d. per 1000 feet.]

Proposed Lighting of Pavia with Gas.—The municipal council of this city has issued a notice, inviting proposals from contractors for lighting about 500 public lamps with gas. The tenders are to be sent in before the 7th of April next, and a copy of the conditions may be seen upon application to Mr. T. G. Barlow, 42, Parliament Street, London.

The Gas Concert.—The concert at the Victoria Rooms at Clifton, in which the band of the Avon Street, Bristol, Gas-Works took the principal part, went off with great *éclat*. There were upwards of 1200 persons present, and the excellent style in which the band executed the pieces set down for them in the *programme*, astonished the audience. The band fund, it is expected, will realize fully £50 by the concert.

Test for Sulphide of Carbon in Coal Gas.—Dr. C. Herzog communicates the following to *Chem. Centralblatt*, No. 1, 1861, p. 1:—Prepare a saturated solution of ammonia in absolute alcohol and a perfectly saturated solution of sugar of lead. Place in a test-tube five drops of the lead solution and about a drachm of the alcoholic ammonia, and allow the gas to bubble through the solution from a narrow glass tube just dipping under the surface. If sulphide of carbon be present in the gas, the solution immediately takes an orange colour, and, after a time, a deep brown precipitate falls. If carbonic acid be present as well, a white precipitate also is produced, which gives a brighter tinge to the orange colour. For a controlling experiment, the gas may be passed for a short time through the alcoholic ammonia alone, and a couple of drops of the lead solution added afterwards, whereupon, if sulphide of carbon be present, the orange precipitate is produced as before. To free the gas from sulphuretted hydrogen, it may be first passed through a lead solution, which does not affect the sulphide of carbon. The author remarks that the orange precipitate obtained as above, if allowed to remain in the liquid, turns white in twenty-four hours, but if collected on a filter immediately, washed a little, and then dried, it remains of a dark-brown colour. The chemical changes which take place when sulphide of carbon is passed into the alcoholic ammonia are, according to the author, rather complex and somewhat variable, but he recommends the test as very simple and practical.

* Anhydrous sulphuric acid gives one-fifth of its weight of oxygen, or 14·760 cubic mètres per 100 kilogrammes. Chamber acid of 54° contains 50 per cent. of anhydrous acid.

Price Current.

CASTINGS, per Ton.

Average Weight of Cast-Iron Gas-Pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lbs.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle.	Wales.	Yorkshire, Derbyshire, and Staffordsh.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Pig Iron, No. 1	3 5 0	2 10 0	2 12 6	3 0 0	3 5 0
1¼ and 2 inches Socket-Pipes	7 0 0	6 0 0	6 5 0	6 10 0	6 15 0
2½ and 3 „ „	6 10 0	5 10 0	5 15 0	6 0 0	6 5 0
4 and 5 „ „	6 0 0	5 0 0	5 5 0	5 10 0	5 15 0
6 in. and upwards „	5 15 0	4 15 0	5 0 0	5 5 0	5 10 0
Retorts, 1st fusion, hot blast	5 10 0	4 10 0	4 15 0	5 0 0	5 5 0
„ 2nd „ cold „	6 10 0	5 5 0	5 10 0	6 0 0	6 5 0
Tank Plates, ⅜ thick and above	6 0 0	5 0 0	5 5 0	5 10 0	5 10 0

WROUGHT-IRON TUBING,

Subject to 40 per cent. Discount.

	2 in.	1¼ in.	1¼ in.	1 in.	¾ in.	½ in.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent Welded Tubes, from 2 to 12 ft., perft.	1 8	1 0	0 10	0 7	0 5	0 4½
„ „ „ 6 in. to 18 in., each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting-Pieces, or Long Screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, Springs, and Elbows—wrought iron	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, wrought or cast	4 6	3 0	2 6	2 0	1 6	1 2
Iron Cocks	17 6	9 6	7 6	4 6	3 3	2 6
„ with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing Sockets, Caps, Plugs, and Plain Sockets	1 3	0 9	0 8	0 6	0 5	0 4
Syphons, 2 quart [Nipples	1 0	0 8	0 7	0 5	0 4	0 3
	15 0	14 0	13 6	13 0	12 0	—

COALS, per Ton.

Newcastle.—Unscreened.		*Scotch Cannel.*	
Whitwell Primrose	6s. 9d.	Boghead, at Leith	45s. 0d.
Medomsley, Eighton Moor, and Burnhope	7 0	Kirkness, best	23 0
Pelaw	7 3	Capeldrae, 1st quality	20 0
New Pelton, Pearth, South Pelaw, Washington Hutton, and South Peareth	7 6	„ 2nd „	12 6
Pelton	7 9	Lesmahago, at Glasgow	25 0
Ramsay's Newcastle Cannel	16 0	„ „ Leith	27 6
		Arniston	27 6
		Wemyss	20 0
		Knightswood	18 0
		Pirnie	15 0

FREIGHTS.

Coastwise—Newcastle.—Per Ton.		*Foreign.—Per Keel.*	
Chatham & Rochester	8s. 3d.	Boulogne and Calais	£ 9 10 0
Cork	12 6	Barcelona	23 0 0
Dover	9 0	Bordeaux	16 0 0
Dublin	13 3	Cadiz	15 0 0
Exeter Quay	11 6	Copenhagen	10 0 0
Folkestone	9 0	Dieppe	10 5 0
London (Pool)	8 6 to 9 0	Genoa	22 0 0
Lowestoft & Yarmouth	6 6 to 6 9	Hamburg	9 17 6
Lynn	—	Havre	11 5 0
Portsmouth	10 6	Leghorn	20 0 0
Plymouth	11 0	Lisbon	16 0 0
Ramsgate & Margate	9 0	Rotterdam	—
Whitstable	8 6	Stettin	11 5 0
Weymouth	11 0	Trieste & Venice	25 0 0

SUNDRIES.

Best Newcastle Fire-bricks	per 1000	50s. 0d. to 55s. 0d.	
Cliff's Fire-bricks, at Wortley	per 1000	55 6	
Ingham's Fire-bricks, at Wortley	„	55 6	
Fire-clay Retorts	per foot run,	5s. 6d. to 7 0	
Tough Cake Copper	per ton	£102 10s.	
English Pig Lead	„	21 5	
Welch Bar Iron, in London	„	6 7 6	
Tarred Rope Yarn	per cwt.	26s. 0d.	
Foreign Spelter	per ton	£18 10 0	
English Block Tin	„	128 0 0	
Banca	„	127 0 0	

TENDER FOR GASHOLDER.

THE Directors of the Gaslight Company of ABERDEEN are desirous of obtaining TENDERS for the Supply and Erection of a GAS-HOLDER, 60 Feet Diameter by 32 Feet Deep, with Standards, Guides, &c., all in terms of Plan and Specification, which may be seen on application at the Company's Office.

Sealed Tenders, addressed to the Directors, and marked, "Tender for Gasholder," to be lodged on or before the 16th day of March next.

By order,
GEO. GORDON, Manager.
Gaslight Company's Office, Aberdeen,
Feb. 19, 1861.

GAS-FITTING Business to be DISPOSED OF, in consequence of the death of the Proprietor. Coming in for Tools and Stock, about £150.

For particulars, apply to Messrs. HULETT and Co., 55, High Holborn, LONDON.

CLAY Purification of Gas, whereby a total removal of AMMONIA is effected, may now be carried out by all Gas Companies, and made a SOURCE OF CONSIDERABLE PROFIT. Any Gas Company wishing to adopt the process, can have full particulars as to use of patent, &c., on application to ALEX. SIMPSON, Steam Mills, Snow Hill, BIRMINGHAM.

WANTED, a Situation as Manager of a Provincial Gas-Work. Has held a similar situation in one Work 3½ Years, and employed in another for 14 Years. Age 32. Married. Good reference.

Address P. B., 1, Stone Street, Gravesend, KENT.
N.B. No objection to go abroad.

TO GAS COMPANIES.

WANTED, a Situation as Manager, by one who, during many years' experience—7 of which as Sub-Engineer—in large Gas-Works, has acquired, practically, a thorough knowledge of the whole course of Manufacture and Distribution. Willing to go abroad at once.

D. L. R., 8, Waterloo Terrace, COMMERCIAL ROAD, E.

GAS-WORKS, Sidmouth, to be Sold. May be viewed, by application to Mr. P. HAYMAN, the Manager, and particulars had of the Proprietor, C. T. HOLCOMBE, Esq., Valentines, Ilford, ESSEX.

TO GASHOLDER MAKERS, IRONFOUNDERS AND OTHERS.

THE Directors of the Loughborough Gas and Coke Company are prepared to receive TENDERS for the Supply and Erection on their Works, at Loughborough, of a GASHOLDER, 65 ft. in diameter and 20 ft in depth.

The Plans may be seen and Specifications had, on application to the Manager at the Works.

Sealed Tenders to be addressed to RICHARD CROSKER, Esq., Chairman of the Gas Company, Loughborough, to be sent in on or before the 4th day of March next, marked "Tender for Gasholder."

The Directors do not bind themselves to accept the lowest or any Tender.

Gas and Coke Company's Office, Loughborough,
Feb. 12, 1861.

GAS APPARATUS MANUFACTURERS.

A Practical Superintendent Engi- NEER, in the Manufacture of Gas Apparatus, on small and extensive Works, is open to an ENGAGEMENT in a similar capacity. Can undertake the entire responsibility, and Erection of Gas-Works. Gasholders complete at home or abroad.

Address, P. S. E., at the Office of the GAS JOURNAL, Bolt Court, FLEET STREET.

MIRFIELD Gas Company.—Tenders for a GASHOLDER required, for the Mirfield Gas-Works, 100ft. diameter, and 40 ft. deep, in 2 lifts. Plans and Specifications to be seen at the Offices of the Company, on Saturday, the 9th day of March next, from 9 a.m. to 4 p.m.

Sealed Tenders, marked "Tender for Gasholder," to be sent in to the Offices of the Company, addressed to the Engineer, on or before Saturday, the 16th day of March. The lowest or any Tender may not be accepted.

Mirfield, Gas-Works, Feb. 23, 1861.

WANTED, an Agent residing at Cologne, to undertake the SALE of IRON, BRASS, and COPPER BOILER TUBES; also GAS, STEAM, ENAMELLED, and GALVANIZED TUBING, &c. &c. &c., for the Districts of Holland, Belgium, and the Rhine.

The best Testimonials, as well as experience in the trade, will be required.

Address, by letter, to C. M. M., Post Office, BIRMINGHAM.

FOR SALE. At a reduced price. A SET of CIRCULAR DRY LIME PURIFIERS, capacity 40,000 ft. per hour, well adapted for the Oxide process; with 10 in. connexions, hydraulic valve, rotary lifting apparatus. Water Supply and Waste-pipes, &c.; together with Columns and Circular Iron Roofing.

The above, having been superseded by others of much larger capacity, will be disposed of on very reasonable terms.

To be seen at the Western Gas-Works, Kensal Green, LONDON.

WANTED to Purchase. Two Good SECOND-HAND PURIFIERS, size from 6 ft. × 4 ft. to 8 ft. × 6 ft.

Apply, stating price &c., to the SECRETARY, MARKET RASEN GAS COMPANY.

TO GAS COMPANIES, &c.

FOR SALE.—A Second-hand Cast- IRON TANK (good as new), 36 feet 6 inches by 12 feet deep, with Seven Cast-Iron Columns; 6-inch Inlet and Outlet Pipes complete.

Apply to GEORGE CUTLER and Co., 8, Wharf, Wenlock Road, City Road, LONDON.

THE Provanhall Coal Company beg to intimate that they are prepared to ship their Cannel Coal at Glasgow, Grangemouth, or Leith, and to deliver the same at places having communication by Railway.

Analyses by Professor Penny, and Certificates from Parties using the Coal, will be forwarded, and terms learned on application at their Office, 20, Jackson Street, GLASGOW.

TO be Sold—Four Dry-Lime Purifiers, each 7 ft. 8 in. × 6 ft. × 3 ft. 6 in., with 10 in. Water Lute, 8 in. Connexions, Centre Valve, and Lifting Crane, complete, and four tiers of Wrought-Iron Sieves.

Also a GASHOLDER, 50 ft. × 12 ft., with six Cast-Iron Columns and Guides, and counterbalanced at three points.

Also a GASHOLDER, 40 ft. × 12 ft., with four Cast-Iron Columns, triangular Wood Frames, and counterbalanced.

The above are all in good condition, and only parted with to make room for extensions.

For price and further particulars, apply to Mr. HUNTER JONES, Gas-Works, NORTHAMPTON.

CAST-IRON Tanks and Gasholders for Sale.—To make room for contemplated alterations within their works at Leith, the Edinburgh and Leith Gaslight Company have resolved to dispose of two CAST-IRON TANKS, with their respective Gasholders and appurtenances, together or separately, all as presently in good working order at the works.

The Larger Tank is 39 ft. 9 in. diameter, and 18 ft. deep. The Smaller, 34 ft. 6 in. diameter, and 16 ft. 2 in. deep, inside measure. The capacity of Gasholders about 21,000 and 14,000 cubic feet respectively. The whole has been well constructed, and the Tanks, being entirely above ground, are strong and in excellent preservation, and removable with great facility for reconstruction as Gas or Water Tanks immediately after purchase. The Vessels and Apparatus may be examined on application to the Subscriber at the Works, to whom offers from proposing purchasers may be communicated till the 1st of March next.

JOHN REID, Engineer and Manager.
Edinburgh and Leith Gas Company's Office,
8, George St., Edinburgh, Feb. 7, 1861.

CLEGG ON COAL GAS.

Now Ready, price £1. 11s. 6d., cloth, the Third Edition, greatly enlarged, and with numerous additional Illustrations, of

A PRACTICAL TREATISE on the MANUFACTURE and DISTRIBUTION of COAL GAS, its Introduction and Progressive Improvement. Illustrated by Engravings from Working Drawings, with General Estimates. By SAMUEL CLEGG, Jun., M. Inst. C.E.

London: JOHN WEALE, 59, HIGH HOLBORN.

JAMES FERGUSON and CO., Lessees of the Auchinheath and Craignethan Gas Coal-fields (the most extensive and valuable in the parish of Lesmahago), respectfully intimate to the Managers of Gas-Works and Consumers of Gas Coal, that they are prepared to ship the best quality of the above well-known COALS at Glasgow or Leith; and also to deliver them at the railway stations upon, or connected with, the Caledonian Railway, to any extent which may be required.

Price, free on board, or delivered at the railway stations, may be learned by addressing James Ferguson and Co., Gas-Coal Works, Lesmahago.

Shipping Agent for Glasgow:
MR. ALEXANDER STRATTON,
159, WEST GEORGE STREET.

GAS PURIFIERS FOR SALE.

THE Committee of Management of the GREENOCK GAS-WORKS have for sale (deliverable in April next) FOUR DRY LIME PURIFIERS, each 13 feet 4 inches long, 8 feet 2 inches broad, and 4 feet 6 inches deep (inside measurements), with connexions, four tier of malleable iron sieves, wrought-iron covers, and lifting-crane; for all which they will be glad to receive Tenders. The purifiers are in excellent condition, are in constant use, and are to be parted with solely because the committee intend to procure others of a larger size.

Further particulars may be obtained on application to the MANAGER, by whom Tenders will be received till March 1, 1861.

The Committee do not bind themselves to accept the highest or any Tender.

ALEXANDER RITCHIE, Manager.
Gas-Works, Greenock, Jan. 12, 1861.

WALCOTT'S NEW PATENT RETORT.

ONE-THIRD of Furnace Fuel com- monly used saved. A Six or other sized Bed of Retorts can be changed at once into a Three or Two-Bed, &c., when working or down. "*Furnace fed with two currents of* HEATED *air to intensify combustion.*"

The Fire playing on the back and two side walls, also covering arch in common settings, is permeating on larger-sized retorts. An effectual method devised for destroying the incrustation of Carbon inside Retorts. The patent Retorts and Furnaces are more easily repaired than the common settings.

Prices, Plans, &c., from Mr. GEO. WALCOTT, Gas Engineer, 24, Abchurch Lane, LONDON.

Moneyed Partner wished for Working Patent

TO GAS COMPANIES AND CONTRACTORS.

FOR Sale, several lengths of Hydraulic MAIN, 14 inches diameter and 6 feet 9 inches long, with 7 holes for DIP-PIPES.

Also 4-inch ASCENSION-PIPES, and 3-inch ARCH and DIP-PIPES, and RETORT MOUTHPIECES, all in excellent condition, and will be sold at a very low price, and delivered, if required, at any Railway Station in London.

To be seen, on application to the ENGINEER, at the Equitable Gas Company's Works, Lupus Street, PIMLICO.

EDWIN DIXON,

WOLVERHAMPTON PATENT WROUGHT-IRON TUBE WORKS,

Originally established in 1833,

Manufacturer of Gas and other Tubes, Fittings, and articles of every description belonging to Gas, Water, or Steam.

E. D. had the honour of receiving the

PRIZE MEDAL

awarded to this Manufacture by the COUNCIL of the GREAT ENGLISH EXHIBITION of 1851; and from he latter date has supplied many towns exclusively with GALVANIZED and other Tubes for Gas and Water, under GOVERNMENT ENGINEERS.

A City, containing 150,000 inhabitants,

has recently been entirely supplied with Tubes made at the above-named Works, and several others with populations nearly as great; in fact, the reputation now acquired induces this notice to the public.

Large Stocks generally on hand, averaging from one to three hundred thousand feet.

HYDRAULIC PRESS TUBES,

to resist 6000 lbs. and upwards to the square inch, extensively manufactured.

STOCK DIES and SCREWING TACKLE

of the best possible description.

Every Tube carefully tested with Hydraulic Pressure before leaving the Works.

FIRE-CLAY RETORTS.

JOHN SWARBRICK,

MANUFACTURER OF PATENT COMPOSITION CLAY RETORTS,

FIRE BRICKS OF EVERY DESCRIPTION, SHAPE, AND SIZE, &c. &c.

HIGHER EANAM, BLACKBURN, LANCASHIRE.

These RETORTS are generally used in the Gas-works of Preston, Accrington, Bury, Heywood, Middleton, Rochdale, Ratcliffe; the Mills of Messrs. Horrocks, Miller, and Co., Preston, &c. &c., and are unequalled in having afforded general satisfaction to those who have given these Retorts a trial.

To meet the increasing demand, the Works at Little Harwood have been greatly enlarged; and Gas Engineers who may favour with an Order may rely with confidence on their being promptly supplied with an article not to be surpassed in finish or durability.

PRICES MODERATE.

GEORGE BOWER,
GAS ENGINEER, MANUFACTURER, AND CONTRACTOR,
ST. NEOT'S, HUNTS.
References to between 100 and 200 Gas-Works Designed and Erected by the Advertiser.

THOMAS W. ALLSOPP,
GAS ENGINEER AND CONTRACTOR.
CASTLE DONINGTON, NEAR DERBY,
Manufacturer of every description of Gas Apparatus, Gasholders, Boilers, &c.

GEORGE CUTLER & CO.,
GAS ENGINEERS, &c.,
London Gasholder and Boiler Works,
8, WHARF, WENLOCK ROAD, CITY ROAD, N., LONDON.

Rye, Nov. 12, 1860.
Dear Sirs,—I consider it incumbent on me to acquaint you that the alterations recently made on the Rye Gas-Works—viz., the addition of a NEWLY-IMPROVED WASHER, and other work for the Purification of Gas, executed by the experienced workmen under your able supervision—are perfectly satisfactory to the Company, and the Gas is now as pure as it can be made.
I am, dear Sirs, your obedient servant,
CHARLES THOMAS, Superintendent,
Rye Gas-Works.
Messrs. Cutler and Co.

ROBERT MACLAREN and CO.,
EGLINTON FOUNDRY, GLASGOW,
Manufacturers of all sizes of Cast-Iron Main Pipes, by an improved Patent. General Ironfounders, Gas Engineers, and Wrought-Iron Tube Makers.

SAMUEL CUTLER, Gasholder
MAKER and CONTRACTOR
For Tanks, Roofs, Purifiers, Condensers, Erection and Alteration of Works and every description of GAS APPARATUS.
PROVIDENCE IRON WORKS,
MILL WALL, POPLAR, LONDON, E.
Main Laying and Gas-Works erected complete.

WEST and GREGSON, Gas-Meter
MANUFACTURERS, &c.
UNION STREET, OLDHAM.
Station and Experimental Meters, Gas Pressure Registers, Gauges, Experimental Gasholders, Governors, Slide Valves, &c. &c.
W. and G. would respectfully call the attention of Gas Engineers and Managers to their Station-meters, having made and erected the largest in use at the present time, two of which may be seen at the Stockport and Liverpool Gas Works, on application to the respective Engineers.

WHITEHOUSE and CO., Boiler and GASHOLDER MAKERS,
GLOBE PATENT TUBE WORKS
WEDNESBURY,
Beg to draw the attention of Engineers and Managers of Gas Works to the superior quality of the Article they manufacture, both in respect of the iron employed, and the perfect manner in which it is welded; in proof of which they can refer to the testimonials of the most eminent Gas Engineers, and the experience of the principal of the large Gas Companies of the kingdom.
Orders promptly executed.

TO Mr. BENJAMIN WHITEHOUSE,
GASHOLDER MAKER,
WESTBROMWICH, NEAR BIRMINGHAM.
Sir,—I feel great pleasure in expressing my satisfaction at the manner in which you discharged your duties as CONTRACTOR for the TELESCOPIC GASHOLDER, 150 feet diameter and 60 feet deep, erected at this Company's Nine Elm Station in 1857. From that period to the present I have closely watched its working, and have never found the least defect either in workmanship or material.
During the recent heavy gales the Gasholder, although containing upwards of 1,000,000 cubic feet of Gas, showed no perceptible indications of its influence, but worked as freely and easily as usual.
RICHARD JONES,
Engineer to the London Gaslight Company.
Vauxhall, London, Nov. 9, 1859.

GAS PURIFYING BY REVIVIFIABLE OXIDE OF MANGANESE.

MR. LAMING (Inventor of the Revivified Oxide of Iron Purification) begs to inform Gas Engineers that they may now supersede the material in general use by A REVIVIFIABLE OXIDE OF MANGANESE of his preparing, which in efficacy is at least equal, and in economy superior, to Oxide of Iron. Owing to the greater chemical activity of Manganese, common dry-lime purifiers of ordinary capacity will often be amply sufficient for it, though they may be too small for the Oxide of Iron material.
For Gas-Works possessing steam power, more especially such as are exposed to public complaint, Mr. Laming recommends the purification to be done either wholly or in part (depending on extent of apparatus) in out-of-doors scrubbers, hermetically sealed, by means of his liquid process, which is both economical, and meets all practical requirements.
118, Fenchurch Street, Aug. 1, 1859.

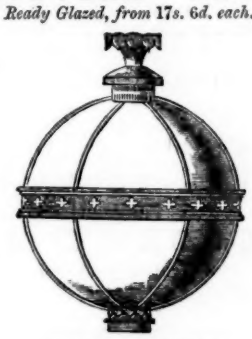
Now ready,
VOL. IX. of the JOURNAL of GAS LIGHTING, WATER SUPPLY, and SANITARY IMPROVEMENT, for 1860, price 21s., bound in cloth and lettered. A few copies of Vols. II., III., IV., V., VI., VII., and VIII. are still on sale.
W. B. KING, 11, Bolt Court, Fleet Street.

Just Published, price 3s., by Post, 3s. 2d.,
THE CHEMISTRY OF GAS LIGHTING,
with an Appendix containing a description of the different processes for the Manufacture of Colouring Matters from Coal Tar.
Re-arranged and reprinted from the JOURNAL OF GAS LIGHTING.
LONDON: WILLIAM B. KING, 11, BOLT COURT, FLEET STREET, E.C.

CAUTION.
TO GAS-METER MANUFACTURERS AND OTHERS.
THE Undersigned hereby caution Meter Manufacturers and others against infringing the exclusive right of the Undersigned to the use of the Screw Adjustment for regulating the Height of the Overflow-Pipes in Wet Gas-Meters, as described in the Specification of the Letters Patent granted to Crosley and Goldsmith on the 19th of April, 1856; as well as against infringing any other portions of that or any other Patent of the said William Crosley; and
NOTICE is further given, that all Infringers of the said Inventions, or any portions of them, will be proceeded against.
CROSLEY & CO.,
103, SOUTHWARK BRIDGE ROAD,
LONDON, Aug. 29, 1859.

Gas Stoves, Gas Baths, Gas Cooking APPARATUS, warranted the best in England, at PHILLIPS's, the original inventor and manufacturer, and general gas-fitter, &c., 55, Skinner Street, Snow Hill, LONDON, E.C.
PATENT SAFETY ATLAS CHANDELIERS, Sun and Star Burners, Outside Lamps, Patent Reflecting Lamps, Portable Coppers for either Gas or Fuel. Iron Tube and Fittings. Best quality for Gas, Steam, or Hot Water, &c. &c.

GLOBULAR LAMPS,
Ready Glazed, from 17s. 6d. each.



LAMP-POSTS
Of a Superior Class in Stock as well as the Ordinary Descriptions.
Engravings and Prices on application to
WILLIAM HOOD,
12, UPPER THAMES STREET, LONDON.

WILLIAM BLEWS AND SONS'
IMPROVED MACHINE-MADE BURNERS,
WROUGHT-IRON BATSWINGS,
FOR RAILWAY STATIONS AND MARKETS,
GAS-FITTINGS, CHANDELIERS,
BRASS AND IRON TUBES OF EVERY KIND
SUPPLIED ON THE BEST TERMS,
AT THE WORKS,
9, 10, 11, BARTHOLOMEW STREET,
BIRMINGHAM.

WALTER MABON, Engineer,
ARDWICK IRON WORKS, FAIRFIELD STREET
MANCHESTER,
Manufacturer of
IRON TANKS for Gasholders, Railway Stations, &c.
GASHOLDERS.—Extensive premises at Gorton, solely for the manufacture of Gasholders, and other heavy Wrought-Iron Structures.
GAS APPARATUS.—W. M. has an extensive assortment of patterns for Purifiers from 4 feet to 15 feet square, also round ones from 4 feet to 10 feet diameter; Scrubbers, Condensers, Washers, Columns, Girders, and Tripod Patterns, suitable for Gasholders, from 10 feet to 150 feet diameter, either Single-lift or Telescope. Contractor for Gas Works of any Magnitude. Designs, Specifications, and Estimates furnished.
WROUGHT and CAST IRON ROOFS for Railway Stations, Gas Works, Warehouses, and Sheds, prepared for Slates or for Corrugated Iron.
IRON HOUSES, either for Dwellings, Manufactories, or Public Buildings.
PIPES and VALVES, for Gas and Water, from 2 inches to 48 inches bore.

ADDISON POTTER,
WILLINGTON QUAY,
NEAR NEWCASTLE-UPON-TYNE,
Manufacturer of Clay Retorts, Fire Bricks, and every description of Fire Clay Goods.

JOSEPH CLIFF and SON,
FIRE-CLAY WORKS,
WEST DENTON, NEWCASTLE-ON-TYNE,
Manufacturers of Clay Retorts, Fire-Bricks, Lumps Tiles, &c.
The seam of Clay from which these goods are made is noted for its fire-resisting properties. Prices very moderate.
Office, 52, Quay Side, Newcastle-on-Tyne.

BELGIAN CLAY RETORTS.
ALBERT KELLER, Ghent.—The removal of the import duties on Earthenware permitting the entry of Clay Retorts into England, Albert Keller, of Ghent, begs to draw the attention of the Gas Companies of London, and other Cities, to the very superior quality of the RETORTS manufactured by him. They can be made of any size, in one piece, and of any form. The price will be in proportion to the weight, and very moderate in comparison to their value.
Communications, addressed to ALBERT KELLER, GHENT, will receive immediate attention.

JAMES NEWTON,
(Established 1820,)
FIRE-BRICK AND TILE MERCHANT,
Wholesale and for Exportation,
FALCON DOCK, 78 AND 79, BANKSIDE,
SOUTHWARK, LONDON.
DEPÔT for STOURBRIDGE AND NEWCASTLE FIRE-BRICKS, LUMPS, TILES, and CLAY, and every Article suitable for
GAS AND WATER WORKS.

HARRIS and PEARSON,
PROPRIETORS OF
BEST CLASS-HOUSE POT AND CRUCIBLE CLAY.
MANUFACTURERS OF
FIRE BRICKS, GAS RETORTS, &C.
AMBLECOTE FIRE CLAY AND BRICK WORKS, STOURBRIDGE.
Late in the occupation of L. and W. King.
Originally J. Pidcock, Esq.
NB. A quantity of best Clay Retorts in stock, viz.—Circulars, 14 inches, 15 inches, 16 inches.
D's, 16×12, 15×14, 20×16, 16×18.

WILLIAM STEPHENSON & SONS,
THROCKLEY,
NEWCASTLE-ON-TYNE,
MANUFACTURERS OF EVERY DESCRIPTION OF
FIRE BRICKS, CLAY RETORTS, LUMPS, TILES, &c. &c.
LONDON OFFICES:
76, KING WILLIAM STREET, CITY.
A large stock of Fire-Clay Goods always on hand in London, at the lowest wharf prices, at Messrs CHRISTIE & Co.'s Wharf, 64, Bankside, SOUTHWARK.

STOURBRIDGE FIRE-CLAY WORKS.
E. BAKER and CO.
(Contractors to Government).
24 WHARF, HARROW ROAD, PADDINGTON, W.
Every article manufactured at their own Works and Mines, Brierley Hill.
FIRE-BRICKS, Lumps, Squares, Tiles, and Gas Retorts of all dimensions.
CRUCIBLE and CEMENT CLAYS.
GARDEN EDGINGS, of various patterns.
BUFF and ORNAMENTAL TILES.
CLINKERS and STABLE PAVINGS, noted for hardness and durability, being perfectly non-baorbent.
Shipments on the shortest notice.

F. SIMMONDS and SON,
RETORT AND BOILER-SETTERS,
AND CONTRACTORS FOR GAS-WORKS IN GENERAL, FOR MATERIALS AND LABOUR, OR LABOUR ONLY.
OFFICE:
2, YORK PLACE, KINGSLAND ROAD, N.E.
Contractors at the Chartered Gas-Works, Curtain Road, and numerous Provincial Gas-Works.

LEONI'S Patent Adamas Gas- BURNERS (secured by Her Majesty's Royal Letters Patent), are entirely free from liability to CORROSION, injury from Heat, or danger of Fracture, and are UNALTERABLE in the dimensions of their Apertures.
Uniformity in the consumption of Gas is obtained by the process of manufacture, which ensures that the Burners shall be of precisely similar pattern.
The Adamas Burners are confidently recommended to Gas-Fitters, Consumers, and Companies.
Sole Manufacturer and Patentee in Great Britain, S. LEONI, Adamas Works, St. Paul Street, New North Road, LONDON, N.

TRUSS'S PATENT ELASTIC PIPE-JOINT,

FOR GAS AND WATER-MAINS, AND STEAM PIPING,

Is the only PERFECT joint that has ever been constructed, and supplies the long-felt desideratum, by allowing for the expansion and contraction of metals, and for oscillation and deflection, without impairing the joint. Gas Companies will effect an incalculable saving in adopting it, as compared with the present imperfect mode of jointing.

Drawings, Estimates, and every particular, furnished on application to

THOMAS SEAVILLE TRUSS, C.E., 53, GRACECHURCH STREET, LONDON, E.C.

WILLIAM SUGG,

MANUFACTURER OF

PATENT DRY AND WATER GAS-METERS, TEST GASHOLDERS, AND APPARATUS,

"EVANS'S" PHOTOMETERS,

Experimental Meters, Minute Clocks, &c., Station Meters and Governors,

STREET-LAMP GOVERNORS AND LAVA BURNERS,

19 and 20, MARSHAM STREET, WESTMINSTER.

EDWARD COCKEY AND SONS'
PATENT GAS VALVES.

These Valves are formed of two Cast-Iron Cylinders, with segmental divisions, having the faces ground gas-tight—the upper Cylinder turning horizontally on the lower one.

The lower Cylinder has pipes from each division, communicating with the vessels to and from which the gas is to be passed. The upper Cylinder has corresponding divisions, so arranged as to direct the passage of gas to the different segmental divisions in the lower part, and when it is turned on the face of the lower one, to alter the flow of gas from one vessel to another.

Each Valve has an index-plate provided, which is to be attached to the floor, and a pointer on the cover of the Valve shows which way it is turned. Thus, the Manager of the Works can at once see in which direction the gas is passing.

There are about fifty of these Valves now in use, of sizes varying from two to twelve inches, and they are giving great satisfaction. Amongst the Works at which they are fixed, the following may be mentioned:—

BASINGSTOKE.	CANTERBURY.	FROME.	RYDE.
BLANDFORD.	ENNISCORTHY.	GODALMING.	SANDWICH.
CHELTENHAM.	ELGIN.	NEWPORT.	WARMINSTER.

They are in course of erection at other important Works.

IRON WORKS, FROME SELWOOD.

EDWARD COCKEY AND SONS

ALSO MANUFACTURE

PURIFIERS, SCRUBBERS, CONDENSERS, AND OTHER IMPROVED GAS APPARATUS,

HAVING PATTERNS SUITABLE FOR GAS-WORKS OF DIFFERENT SIZES.

IMPORTANT TO GAS COMPANIES.

By Her Majesty's Royal Letters Patent.

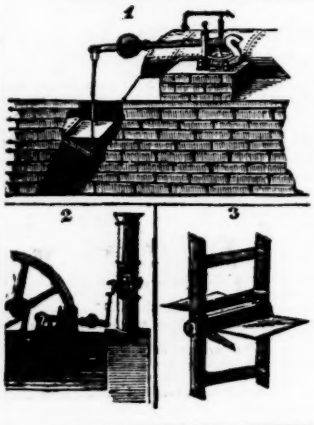
PATRONIZED BY THE LORDS COMMISSIONERS OF THE ADMIRALTY.

R. BARRETT & CO.,

STEAM DAMPER AND FIRE REGULATOR.

CHARLES ROBERTS, AGENT, 17, GRACECHURCH STREET, LONDON.

(TAYLOR AND WEBSTER'S PATENT.)



This Apparatus, from its simplicity of construction, can be easily affixed by any engineer; and, in addition to its being a preventive of boiler explosions, will effect a saving of about 15 to 20 per cent. in fuel. It is suitable for all descriptions of boilers, and can be applied to any at present in use. The following Engineers of Gas Companies have adopted them, of whom reports may be had upon application:—

Imperial Gas Company,	Haggerston,	Mr. Clark, Engineer.
,, ,, ,,	Battle Bridge,	Mr. Methven, ,,
,, ,, ,,	Fulham,	Mr. Kirkham, ,,
Commercial Gas Company,	Stepney,	Mr. Jones, ,,
Ratcliff Gas Company,	Ratcliff,	Mr. Wilton, ,,
Surrey Consumers,	Rotherhithe,	Mr. Croll, ,,
Equitable Gas Company,	Woolwich,	
Consumers Gas Company,	Woolwich,	Mr. Stark, ,,

PERRENS & HARRISON,

THE LYE FIRE-CLAY AND BRICK-WORKS, STOURBRIDGE,

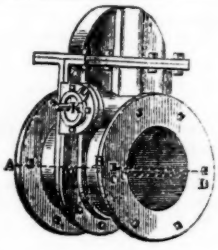
Successors to the late firm of J. and W. KING,

and Sole Proprietors of their well-known CLAY MINES, are prepared to supply

GAS-RETORTS, CLIFT'S PATENT GAS-OVENS and FIRE-BRICKS

OF ALL DESCRIPTIONS,

the superior quality of which will, they are confident, secure them further orders.



BRYAN DONKIN & CO.

keep always on stock their

IMPROVED GAS VALVES

from 2 inches to 18 inches, price 11s. 6d. to 13s. 6d. per inch diameter

List of prices, with full dimensions of all sizes up to 27 inches, to be had on application.

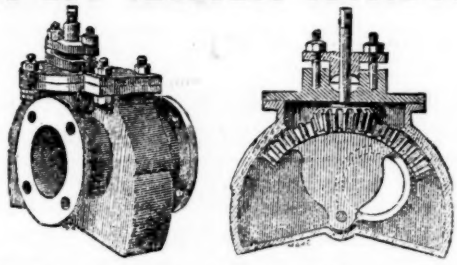
These Valves are all proved to 30 lbs. on the square inch before leaving the works.

BRYAN DONKIN & CO.,

ENGINEERS,

NEAR GRANGE ROAD, BERMONDSEY.

BEST AND CHEAPEST SLUICE-COCK.



BROWN AND MAY'S PATENT.

Above 3-inch diameter, price 10s. per inch. Brass face, 6d. per inch extra.

Can be taken to pieces without being removed from the line of Piping.

NORTH WILTS FOUNDRY, DEVIZES.

Wholesale Agents, Messrs. S. and E. RANSOME, 31, Essex Street, Strand, E.C., Where a Sample may be seen.

WALTER FORD,

LATE

PADDON and FORD,

GAS-METER AND APPARATUS WORKS,

GRAY'S INN ROAD, LONDON.

MANUFACTURER OF WET AND DRY GAS-METERS, STATION-METERS, GOVERNORS, &c. &c.

A large number of **STATION-METERS,** up to 80,000 feet per hour (being by far the largest in use), and **GOVERNORS** for **MAINS,** up to 24 inches, have been constructed by Paddon and Ford. These Meters and Governors possess peculiar advantages as regards strength and freedom of action.

Sole Manufacturer of **PADDON'S PATENT STREET-LAMP REGULATORS,** for insuring any required consumption. These Regulators are in general and increasing use, and references can be given to Gas Companies who use them for every Lamp.

JOSEPH BOULTON,

28, BAGNIGGE WELLS ROAD, CLERKENWELL,

PATENTEE OF

DRY & IMPROVED WET GAS-METERS,

AND

GAS APPARATUS.

All Meters warranted to comply with the Act of Parliament.

F. & C. OSLER,

45, OXFORD STREET, LONDON;

Manufactory—Broad Street, Birmingham—Established 1807,

MANUFACTURERS OF GLASS CHANDELIERS, GLASS LUSTRES, TABLE GLASS, &c. &c.

ELEGANT CRYSTAL GLASS CHANDELIERS, for GAS, from £4 upwards (Made from "REGISTERED" DESIGNS), with GLASS BRANCHES, &c.; suitable for DRAWING-ROOMS and BALL-ROOMS. The more extensive use of GAS in private dwellings has induced Messrs. OSLER to direct their particular attention to the manufacture of this class of articles—which, with a view to their general adoption, are offered at very moderate prices. Purchasers can select from a great variety of patterns, to which additions are being constantly made.

THEATRES, CONCERT, ASSEMBLY, AND BALL ROOMS LIGHTED BY ESTIMATE ON THE LOWEST TERMS.

JAMES OAKES and CO.,

ALFRETON IRON WORKS, DERBYSHIRE,

AND

WENLOCK IRON WHARF, 20, WHARF ROAD, CITY ROAD, LONDON,

Beg to inform Gas and Water Companies and the public, that they keep in stock in London all the CASTINGS in general use in Gas and Water Works, including best cold-blast Iron Retorts, Socket and Flange Pipes of all sizes, Bends, Branches, Syphons, Lamp Columns of various patterns, &c.

N.B.—Orders for Cast-iron Tanks, Girders, Columns, Cylinders, and all irregular castings, will have immediate attention.

CHARLES HORSLEY, Agent.

C. H. is prepared to carry out the warming and ventilation of public buildings, &c.; also civil engineering in general.

BIRTLEY IRON WORKS,

CHESTER-LE-STREET, DURHAM.

Manufactory for every description of Casting and Machinery for Gas Works and Water Works.

Warehouse in London for Cast-iron Pipes and Connections of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.

Office in London, Mr. E. M. PERKINS, 78, Lombard Street.

JOHN ROGERSON and CO.,

NEWCASTLE-ON-TYNE & MIDDLESBRO'-ON-TEES.

Wrought and Cast Iron Pipes, Cast-Iron Retorts, and all kinds of Foundry Work necessary for Gas-Works. Fire-Bricks and Clay Retorts. Gas Coals of every description. Pig, Bar, and Plate Iron.

LONDON HOUSE:

12, ROYAL EXCHANGE BUILDINGS.

WROUGHT-IRON Guides for Gas.

HOLDERS, when Trussed upon scientific principles, are more capable of resisting strains, in every direction, than Cast Columns of any form can be; and weigh only one-fifth as much as the latter. Designs and Working Drawings for Guides and Ties can be obtained of the Inventor, CHARLES DIXON, C.E., Chichester, SUSSEX.

GAS COAL.

BEAL, WALKER, and CO., Coal and

COKE MERCHANTS, No. 1, Walker's Buildings, SHEFFIELD, beg to inform the Directors and Managers of Gas Companies, that they are in a position to contract for the supply of the different sorts of best Gas Coal, such as best Silkstone, Barnsley, and others, at the lowest prices, which may be had on application at the above Office.

ALFRED PENNY, Gas and

CONSULTING ENGINEER,

WENLOCK IRON WORKS,

21 & 22, WHARF ROAD, CITY ROAD, LONDON.

Mr. PENNY having had a large experience in the construction, alteration, and management of Gas-Works, begs to inform the Directors of Gas Companies that he may be consulted on all matters appertaining thereto. He also manufactures Gasholders, Purifiers, and all the various apparatus used in Gas-Works, and keeps in stock Retorts and Mouthpieces, Socket-Pipes, Bends, Branches, T-pieces, &c. &c.

Plans, Specifications, and Estimates prepared.

JOSEPH WILLCOCK

(late BARLOW and CO.),

Mechanical and Architectural Draftsman, Designer, Surveyor, and Lithographer to Gas Engineers and Gas Apparatus Manufacturers, formerly superintending Engineer at the largest Gas Apparatus Manufactory on the Continent.

Patent and Designs Office, 89, Chancery Lane, LONDON, W.C.

GEORGE ANDERSON, Gas and

CONSULTING ENGINEER,

104, LEADENHALL STREET, LONDON (E.C.).

DIRECT-ACTING GAS-EXHAUSTERS,

supplied either with or without Steam-Engines and Boilers.

FOUR-WAY DIAPHRAGM VALVES,

one of which answers the purpose of THREE ordinary Valves, as applied to Purifiers, or in shutting off and passing Station-Meters, Governors, or other apparatus, while the Connecting-Pipes are also much simplified.

RETORT SETTINGS,

designed to be heated by Tar alone, and with a total absence of Smoke.

Illustrated circulars, giving references and every information, may be obtained on application as above.

BENJAMIN GIBBONS, Jun.,

DEEPDALE FIRE-CLAY & BRICK WORKS,

Near DUDLEY,

Manufacturer of every description of Fire-Bricks, Lumps, Quarries, Shields, Flue Covers, &c., to any size or shape required.

FIRE-CLAY RETORTS,

TO MODEL OR DRAWING.

B. G. begs to call the attention of Gas Companies to his Fire-Clay Retorts, which have been used with great satisfaction in some of the largest Gas-Works in the Metropolis and many Provincial Towns in England.

References given, if required.

WILLIAM INGHAM AND SONS,

WORTLEY FIRE-BRICK AND RETORT WORKS,

Near

Leeds.

W. INGHAM and SONS, having for many years been extensively engaged in the Manufacture of

RETORTS AND FIRE-BRICKS FROM THE CELEBRATED WORTLEY FIRE-CLAY,

beg to call especial attention to their RETORTS, which have for many seasons proved to be unsurpassed in quality by any in the Kingdom, their FREEDOM FROM CRACKS and the ADHESION OF CARBON rendering them worthy the attention of all parties interested in the making of Gas.

The Works are of such magnitude as to ensure the prompt execution of orders to any extent.

Estimates for Setting, or Bricklayers sent when required.

GAS OVENS IN SEGMENTS OF EQUAL QUALITY.

A large stock of Fire-Bricks, Fire-Clay, Terra Cotta, and Drain-Pipes of all sizes kept in London at CHRISTIE & CO.—Wharf, 64, Bankside, Southwark, where all particulars of Prices, &c., may be obtained.

N.B.—*Export orders continue to have prompt attention.*

LIVESEY FIRE-CLAY WORKS,

NEAR BLACKBURN, LANCASHIRE.

ORLANDO BROTHERS,

MANUFACTURER OF PATENT CLAY RETORTS,

AND EVERY DESCRIPTION OF

TUBULAR GLAZED SEWERAGE PIPES, BENDS, JUNCTIONS, ETC.

FIRE-BRICKS, TILES, BLOCKS, AND CHIMNEY-TOPS.

WILLIAM PARKINSON AND CO.,

(SUCCESSORS TO THE LATE SAMUEL CROSLEY,)

COTTAGE LANE, CITY ROAD, LONDON, E.C.

Established 1816.

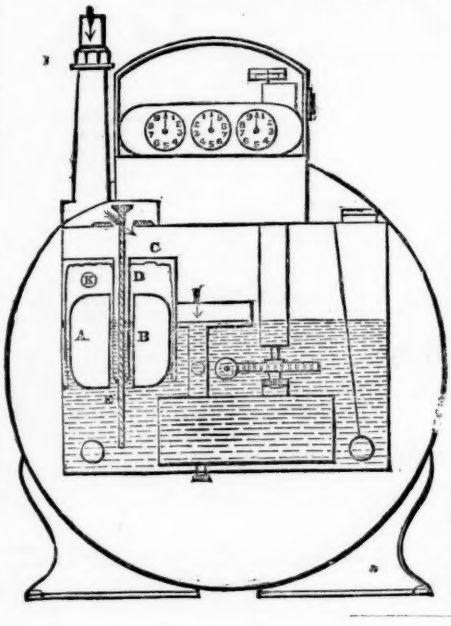
PATENTEES AND MANUFACTURERS OF

STATION-METERS & GOVERNORS,

CONSUMERS' METERS & GOVERNORS,

AND OTHER GAS APPARATUS. Also,

METERS FOR MEASURING WATER.



IMPROVED LOW-SPOUTED GAS-METER,

WITH

NEW PATENT FLOAT ARRANGEMENT.

The Float A is partitioned off from the front frame considerably below the water-line, and is pierced perpendicularly by a tube B.

A large gas-way, C, is left between the top of the partition and the valve-seat. The small tube D, in which the float-wire works, is fixed to the top of the partition, and comes down below the water-line inside the tube B. The float-wire is soldered to the float at E, so as to allow water to pass into the tube D, in order to seal it. The chamber above the float is open to the outlet through the hole K.

The action of this float is exactly opposite to that of ordinary meters. The float is elevated by sudden pressure, and the valve cannot be closed except through want of water.

W. P. and Co. beg especially to call the attention of Gas Companies and others to this New Patent Meter, which entirely overcomes the difficulty experienced by ordinary wet meters, owing to the short range of the float, which is necessary in order to meet the requirements of the "Sale of Gas Act."

They are prepared to supply

TEST GASHOLDERS,

of the most approved description, graduated by the Standard.

CROSLEY & GOLDSMITH'S

PATENT SELF-ADJUSTING & COMPENSATING GAS-METERS

CANNOT BE OVER OR UNDERCHARGED WITH WATER,

and they consequently register the quantity of Gas consumed with greater accuracy than Meters in which the Water-Line is variable.

MANUFACTURED BY

CROSLEY & CO.,

GAS-METER MANUFACTURERS,

103, SOUTHWARK BRIDGE ROAD, LONDON, S.E.

N.B. The Patent Self-Adjusting and Compensating Apparatus may be applied to the ordinary Meter.

Manufacturers of LOWE'S PATENT MOTIVE-POWER METER, for situations where there is an inadequacy of pressure to supply the special requirements of certain consumers in low grounds during the day or night.

Also, Manufacturers of EXPERIMENT METERS, GOVERNORS, MINUTE-CLOCKS, PHOTOMETERS, &c., &c., similar to those used by Mr. King, of Liverpool.

CROSLEY & CO. are also prepared to supply Gas Companies and others with

DUPLICATES of Mr. KING'S CUBIC FOOT TRANSFERRER,

similar to that manufactured by them, and verified by the ASTRONOMER ROYAL, and PROFESSOR MILLER, of Cambridge, on behalf of the Government, which was deposited by C. & Co. in the Office of the COMPTROLLER-GENERAL of the EXCHEQUER before Nov. 13, 1859, in compliance with the "Act for Regulating Measures used in Sales of Gas." They also supply

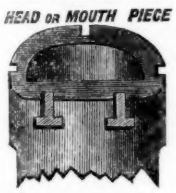
TEST GASHOLDERS,

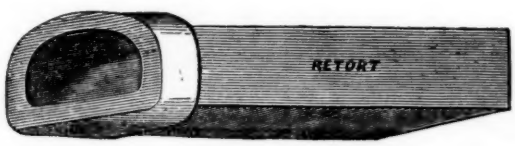
Graduated by the Standard Cubic Foot.

C. and Co. are the only house in the trade which has for years manufactured Meters according to the standard measure set forth in the 2nd Section of the "Sale of Gas Act," and which also comply with the rules laid down in the Section for testing meters. Purchasers of C. and Co.'s Meters may therefore be secured against any additional expenses being incurred in order to adapt their Meters to the requirements of the new Act.

KING BROTHERS,

STOURBRIDGE FIRE-BRICK AND RETORT WORKS.





KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning, thus rendering them FREE FROM CRACKS AND CORRECT IN FORM. By great care in Manufacturing, combined with the advantages in burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize.

Retort Ovens, Fire-Bricks, Guards, Saddles, Rabbitted Burs, Flues, and Quarries, are all Manufactured of the same quality of Clay.

Every Retort and Brick is branded "King Brothers, Stourbridge."

FIRE-CLAY GAS RETORTS.

ESTABLISHED IN 1795.

JOSEPH CLIFF,

WORTLEY FIRE-BRICK WORKS, near LEEDS.

THESE RETORTS are unrivalled in excellence, being the BEST FINISHED INTERNALLY, and THE MOST CORRECT IN FORM, of any in the Kingdom. From the peculiar composition used in working up the face of the material, they are rendered unusually smooth, close, and FREE FROM SURFACE CRACKS, thus, in a great measure, preventing leakage and the adhesion of carbon to their interior surface.

To meet the yearly increasing demand of UPWARDS OF THIRTY SEASONS and to carry out the late improvements in the manufacture, the Premises have been re-erected and much enlarged, and Engineers may rely WITH CONFIDENCE on their orders being completed with a greater regard to despatch than by any other House.

THE WORKS ARE WELL SITUATED

For EXPORT from the Ports of { LONDON, LIVERPOOL, HULL, MIDDLESBRO', HARTLEPOOL, and STOCKTON.

FIRE-BRICKS, LUMPS, GUARDS, TILES, AND CLAY OF THE SAME QUALITY.

M B NEWTON, London Agent, No. 4, Wharf, King's Cross Goods Station.

SALE OF GAS ACT.

MESSRS. CROLL, RAIT, AND CO.,

Manufacturers of Croll's Patent Improved

DRY GAS-METER,

Also Manufacture and Supply

TEST GAS-HOLDERS,

And other Apparatus required by the Inspectors appointed in pursuance of the above Act.

Application for particulars to be made to the Factory,

CANAL BRIDGE, KINGSLAND ROAD, LONDON, N.E.

ALEXANDER WRIGHT,

55 and 55A, MILLBANK STREET, WESTMINSTER, S.W.,

MANUFACTURER OF

CONSUMERS' COMPENSATING & NON-COMPENSATING WET GAS-METERS,

Of the best material and workmanship, carefully adjusted to meet the requirements of the SALES OF GAS ACT.

STATION-METERS & GOVERNORS,

WRIGHT'S REGISTERING PRESSURE-GAUGE, EXHAUSTER REGISTER, & REGULATOR;

STANDARD TEST GASHOLDERS;

Consumers' Governors; Inspectors' Pocket, King's, and all other kinds of Pressure-Gauges; Thermometers for Condensers, Pressure Registers, &c., &c.

EXPERIMENTAL TESTING APPARATUS,

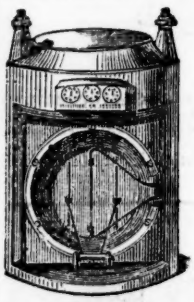
Employed by the best experimenters in this country and on the continent, and by the Gas Testers in the London districts.

PHOTOMETERS, SPECIFIC GRAVITY APPARATUS, BI-SULPHURET OF CARBON TEST, THOMPSON'S BROMINE AND HEATING POWER OF FUEL TESTS, IMPROVED ALKALIMETER, EXPERIMENTAL METERS AND GOVERNORS, MINUTE CLOCKS, &c., &c.

"Analysis of Gas for Practical Men," by A. WRIGHT, M. Inst. C.E., post-free for 13 Stamps. PRICE-LISTS ON APPLICATION.

JAMES MEACOCK,

PATENT DRY AND WET GAS-METER MANUFACTURER,



7, SNOW HILL, AND 16, WEST STREET, LONDON.

ESTABLISHED 1836.

J. M. invites attention to his Improvements in EXPERIMENTAL WET GAS-METERS, by which he renders impossible any Leakage from the Stuffing-Box.

These METERS are GUARANTEED to meet all the Requirements of the SALE OF GAS ACT

GOVERNORS, STATION-METERS, PHOTOMETERS,

EXPERIMENTAL TESTING GASHOLDERS, HIGH-PRESSURE GAUGES,

AND ALL APPARATUS IN USE AT THE GAS MANUFACTORY.

D. HULETT and CO., 55 and 56, HIGH HOLBORN, LONDON,

PATENTEES and MANUFACTURERS of the ONLY GOOD MERCURIAL GAS REGULATOR,

invite the attention of Gas Companies and the Trade generally to their Improved GAS-METERS, which they warrant equal to any in Quality, Workmanship, and Simplicity of Construction, and the only Meters from which Gas cannot be obtained without being duly registered.

MANUFACTURERS OF

GAS CHANDELIERS, GLASS LUSTRES, HALL LANTERNS, VESTIBULES, BRACKETS, PENDANTS;

DOUBLE CONE, ALBERT, SHADOWLESS, & EVERY DESCRIPTION OF BURNER, UNION JETS, BATSWINGS, ETC.;

IMPROVED FULL-WAY CARTER'S VALVES (much approved of);

GAS-STOVES, and every article connected with Gas Apparatus.

CAST & WROUGHT-IRON PIPE, BLACK & GALVANIZED. COPPER. TIN, BRASS, & COMPOSITION TUBING.

D. HULETT'S IMPROVED SERVICE CLEANSER

for clearing out Mains, Services, and Interior Fittings—60s. net.

Boyle's Patent Silvered Glass Combination Reflectors and Outside Lanterns.

Sole Manufacturers of Church and Mann's Photometer.

Large Pattern Books, with every description of Gas-Fittings, Chandeliers, &c., with complete Book of Prices, 12s.

London: Printed by WILLIAM BOUGHTON KING (at the office of Joseph Clayton, 17, Bouverie Street, Fleet Street); and published by him at No. 11, Bolt Court, Fleet Street, in the City of London.—Tuesday, February 26, 1861.